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RADIO **AMATEUR**



Journal of the Wireless Institute of Australia



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- * Review of ICOM IC-2700H VHF Transceiver
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Cover

Budding hams! At left is Willis, the two year old grandson of Keith Sherlock VK2WQ, operating a Morse paddle and monitoring the tone. At right is John, the nine year old grandson of John Bennett VK3ZA, tuning his Barlow-Wadley receiver to listen to his grandfather on his morning sched.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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Strength and Numbers

It is often stated that the strength of an organisation such as ours can be gauged by the number of members in its ranks.

To define "strength" can be difficult and, in terms of an organisation such as the WIA, is frequently presumed to be the power to influence governments and local administrations.

I question this qualification of strength because, for an organisation to be in a position to influence any government simply by the weight of numbers, it would need to boast a membership which could have a significant effect in the electoral arena.

Strength can also stem from knowledge, technical expertise, financial resource and, more importantly, perseverance.

I believe that the real future of the WIA lays not simply in membership numbers but the ability to unite together, with a common cause, the exponents of our great hobby.

A comparatively small group of people, who are dedicated of purpose and united in their efforts to achieve a common goal, will self generate financial support and gain strength.

We need to be responsive to changing technology and society attitudes toward our hobby, and we need to appreciate now, more than ever, the commercial value of the spectrum we are privileged to use at minimal cost.

One of the key factors that makes the hobby of amateur radio so attractive to so many from all walks of life and social standing, is the wide diversity of specialised interest areas which can be enjoyed and provide scope for experimentation.

Regrettably, the diversity of interests has, in recent time, bred a degree of intolerance, misunderstanding and friction within our own ranks.

For the WIA to endeavour to recruit members with a primary interest in a hobby for which amateur radio is only an adjunct, simply to "populate the bands", can give rise to a great number of problems for those who have a genuine interest in amateur communication and experimentation.

Similarly, those who would extol the merit of a situation where all radio amateurs should be required to be members of our society in order to hold a licence flirt with long term danger.

Obvious financial benefits could well be outweighed by having an organisation in which members are recruited by force rather than attraction and the resultant internal conflict of aims and objectives.

Not unlike religion, I believe that the strength of the WIA must come from within and this can only be achieved with tolerance of others, understanding, and a genuine desire to preserve our great hobby interest for all.

Barry Wilton VK3XV
Secretary
WIA Victorian Division
ar

Editor's Comment

Economies of Scale (2)

Last month I discussed how we, the WIA, could be a more efficient organisation if only we had more members. But there is one other consequence of size which goes in the opposite direction. Not, in this case, the size of the organisation, but the size of cities in which so many Australians live.

Australia is probably one of the most urbanised nations on earth. Of our relatively small population of 18 million, occupying about 10 million square kilometres of land, much more than half live in eight capital cities.

Sydney and Melbourne between them are home to nearly seven million people, and at least 7,000 of them are radio amateurs.

Once upon a time (about 40 years ago) each Division of the WIA held monthly meetings of its capital city members. Often these meetings were "packed houses" in sizeable auditoriums. The individual member had a feeling of direct influence on the WIA's activities and policies. Once a month he (or she) could say what he thought, and feel he was part of the action (there were very few lady members in those days, but that is irrelevant!).

Time went on and cities grew. It became more and more an example of "the tyranny of distance" (with thanks to Geoffrey Blainey for his picturesque phrase). The outer suburbs expanded ever further away from the city centre, and the traffic grew thicker and slower! One by one the monthly WIA meetings faded away as less and less amateurs felt inclined to brave the two-way night journey, by private or public transport.

Sydney was the first to go, with its population at the time probably around two million (now nearer four). Melbourne followed a few years later, then Brisbane, quite recently. Adelaide and Perth still have central city meetings, but they each have only about one million population. Hobart and Darwin are still flourishing meeting centres, with populations of

Continued on page 55

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division Address	Officers	Weekly News Broadcasts	1984 Fees
VK1 ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7008	President Rob Apathy Secretary Len Jones Treasurer Don Hume	VK1KRA VK1NLJ VK1DHW 3.570 MHz LSB, 146.950 MHz FM, 436.525 MHz FM each Monday evening (except the fourth Monday) commencing at 8.00 pm. Repeated on Wednesday evening at 8.00 pm on 146.950 MHz FM.	(F) \$70.00 (G) (S) \$58.00 (X) \$42.00
VK2 NSW Division 109 Wigram Street Parramatta NSW (PO Box 1066 Parramatta 2124) Phone (02) 889 2417 Freecall 1800 817 644 Fax (02) 633 1525	President Michael Corbin Secretary Roger Harrison Treasurer Terry Ryeland (Office hours Mon-Fri 11.00-14.00 Wed 1900-2100)	VK2PFO VK2ZRH VK2UX From VK2WI 1.845, 3.595, 7.146*, 10.125, 24.950, 28.320, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.180, 18.120, 21.170, 584.750 ATV sound. Many country regions relayed on 2 m or 70 cm repeaters. Sunday 1030 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 70 cm, 23 cm. Voicemail highlights on (02) 724 8739. Some broadcast text is occasionally available on packet.	(F) \$86.75 (G) (S) \$83.40 (X) \$38.75
VK3 Victorian Division 403 Victoria Boulevard Ashburton Vic 3147 Phone (03) 885 9281	President Jim Linton Secretary Barry Wilton Treasurer Rob Halsey (Office hours Tue & Thur 0830-1530)	VK3PC VK3XV VK3XLZ 1.840MHz AM, 3.615SSB, 7.085SSB, 53.900 FM(R) Mt Dandenong, 146.700 FM(R) Mt Dandenong, 146.800 FM(R) Mildura, 148.900 FM(R) Swan Hill, 147.225 FM(R) Mt Baw Baw, 147.250 FM(R) Mt Macedon, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday.	(F) \$72.00 (G) (S) \$58.00 (X) \$44.00
VK4 Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (07) 284 9075	President Murray Kelly Secretary Lance Bickford Treasurer Roger Bingham	VK4AOK VK4ZAZ VK4HD 1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400 MHz, 52.525 regional net repeaters and 1296.100 0900 hrs Sunday. Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) \$72.00 (G) (S) \$58.00 (X) \$44.00
VK5 South Australian Division 34 West Thebarton Road Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Garry Horden Secretary Maurice Hooper Treasurer Bill Wardrop	VK5ZK VK5EA VK5AWM 1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.000 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT) 3.555, 7085, 10125, 146.700, 0900 hrs Sunday	(F) \$70.00 (G) (S) \$58.00 (X) \$42.00
VK6 West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 434 3283	President Cliff Bastin Secretary Ray Spargo Treasurer Bruce Hedland-Thomas	VK6LZ VK6RR VK6OO 146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 1.825 3.560, 7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525 MHz. Country relays 3.582, 147.350(R) Busellon 146.90(R) Mt William (Bunbury) 147.225(R), 147.250(R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker broadcast repeated on 146.700 at 1900 hrs.	(F) \$60.75 (G) (S) \$48.60 (X) \$32.75
VK7 Tasmanian Division 148 Derwent Avenue Lindisfarne TAS 7015 Phone (002) 43 8435	President Andrew Dixon Secretary Ted Beard Treasurer Peter King	VK7GL VK7FB VK7ZPK 146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RWN), 3.570, 7.090, 14.130, 52.100, 144.150 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) \$69.00 (G) (S) \$55.85 (X) \$40.00
VK8 (Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).		Membership Grades Full (F) Pension (G) Needy (G) Student (S) Non receipt of AR (X)	Three-year membership available to (F) (G) (X) grades at fee x 3 times.

Note: All times are local. All frequencies MHz.

Beam Antennas With Bent Elements

— Part 2

John Sproule VK2AGT*

Part 1 of this article presented the findings of an investigation into the characteristics of representative types of bent beam, comparing them with a normal Yagi. Promise was given that Part 2 would back it up with sufficient theory to enable a better understanding of the characteristics, and would show how the necessary self and mutual impedances were computed and checked.

Relationships For a 2-Element Beam

The driven element will be numbered 1 as previously and the parasitic reflector will be numbered 2. No matter what the shapes of the two elements, the well known equations below relate the voltage V_1 applied to the centre of the driven element, the current I_1 at the same point and the current I_2 at the centre of the reflector.

$$V_1 = I_1 Z_{11} + I_2 Z_{12}$$

$$0 = I_1 Z_{12} + I_2 Z_{22}$$

where:

Z_{11} = self-impedance of element 1 and in general is a complex number and may be expressed as $R_{11} + jX_{11}$ (self-resistance and self-reactance) or $|Z_{11}| \angle \theta_{11}$ (magnitude and phase angle) when appropriate.

Z_{22} = self-impedance similarly of element 2

Z_{12} = mutual impedance between elements 1 and 2 and may be expressed as $R_{12} + jX_{12}$ (mutual-resistance and mutual-reactance) or $|Z_{12}| \angle \theta_{12}$ (magnitude and phase angle) when appropriate.

The notion that the reflector of the Double-U type, for example, is not a true parasitic governed by these same equations is wrong.

The steps in solving the two equations are not important at the moment. All that matters is that they

lead to the expressions listed below for the basic beam characteristics. These are listed in the sequence in which they are used in a computer program to calculate the performance of a beam. In order to clarify some comments I wish to make, the mathematical expressions are written in full for the case of a self-resonant reflector ($X_{22} = 0$) with the addition of notes to cover the case of a non-resonant reflector. Reference will be made in the comments to the beams covered in Figure 1 of Part 1.

Input Resistance of Beam

$$R_1 = R_{11} - \frac{|Z_{12}|^2}{R_{22}} \cos 2\theta_{12}$$

For a non-resonant reflector replace R_{22} by $|Z_{22}|$ and the angle by $(2\theta_{12} - \theta_{22})$.

This equation shows that, for a self-resonant reflector, the input resistance is equal to, less than, or greater than the self-resistance of the driven element depending on the phase angle of the mutual impedance.

If $\theta_{12} = 45^\circ$, then $\cos 2\theta_{12} = 0$ and therefore $R_1 = R_{11}$. This is so for cases C of the double-V and double-U types.

If $\theta_{12} < 45^\circ$, then $\cos 2\theta_{12}$ is positive and therefore $R_1 > R_{11}$. This is so for a Yagi.

If $\theta_{12} > 45^\circ$, then $\cos 2\theta_{12}$ is negative and therefore $R_1 < R_{11}$. This is so for cases A and B of the Double-U type.

Input Reactance of Beam

$$X_1 = - \frac{|Z_{12}|^2}{R_{22}} \sin 2\theta_{12}$$

For a non-resonant reflector, make same changes as for resistance. Since the driven element has been taken to be self-resonant, the input

reactance shows the detuning due to the presence of the reflector.

De-tuning is zero only if $\theta_{12} = 0$. The nearest approach to this condition is with a close-spaced Yagi. The phase angle for bent beams can be much larger and de-tuning can become quite high. This is opposite to the claims of some proponents of bent beams.

Driven Element Current

$$I_1 = \sqrt{\frac{W}{R_1}}$$

Where W is the power input to the beam and taken as 100 W for convenience in all my programs.

A high input resistance (due to θ_{12} being greater than 45°) results in a relatively small current in the driven element, and gain then depends more heavily on the reflector current.

Reflector Current

$$I_2 = - I_1 \frac{|Z_{12}|}{R_{22}} \angle \theta_{12}$$

For a non-resonant reflector, replace the phase angle by $(\theta_{12} - \theta_{22})$.

For a self-resonant reflector, the phase angle of the mutual impedance (θ_{12}) alone determines the phase angle of the reflector current (relative to the reverse of the current in the driven element) and has a greater influence on gain and front/back than the current-ratio.

Gain and Front/back ratio

No mathematics is included for vector summation of the remote fields of the driven element and the reflector since, in the general case of a bent beam, the spacing between the elements varies over their length. It is necessary to divide the elements into a number of small sections, each with its particular spacing and current and then vectorially add the fields of all the sections.

Current-ratio

$$\frac{|I_2|}{|I_1|} = \frac{|Z_{12}|}{R_{22}}$$

For a non-resonant reflector replace R_{22} by $|Z_{22}|$

This ratio is included only because it has featured so prominently in most published descriptions of bent beams, often under the name "coupling factor". The relationship above shows that the ratio can be increased, either by increasing the magnitude of the mutual impedance (Z_{12}), or by decreasing the self-resistance of the reflector (R_{22}). Ref (3) mentions only the mutual effect. But with a pocket calculator you can quickly see from the values of Z_{12} and R_{22} , listed in the Appendix of Part 1 (Table III), that the decrease in R_{22} with bending is more significant than the increase in Z_{12} , except for the Double-V type. Finally, it may be noted that, with the low value of R_{22} of Case A of the Double-U type, the current ratio would exceed unity, even if the mutual impedance were no greater than that of a Yagi of the same element spacing. I wonder about the method of measuring currents when I read of adjusting the tip spacing of such a beam for unity current-ratio.

Before moving on to the method of computing the self and mutual

impedances, I might emphasise the very significant effect on all the performance characteristics of the phase angle of the mutual impedance. Bending increases the angle, due to both decrease in the mutual resistance and increase in the mutual reactance.

Mutual and Self Impedances

I was unable to find any published figures for the mutual impedance between bent antenna elements and, initially, none for self impedance. Early in my attempts to understand the V-5 antenna, VK2IJ had referred me to the two classical papers by Carter and Brown of RCA (Refs 6 and 7). Brown's figures for the mutual impedance between straight elements were reproduced in all antenna handbooks until well into the computer age. His methods of calculation could be applied to elements of any shape and, in fact, he applied them to vertical broadcast antennas of a T shape. So I set out to apply his methods, initially to a V-5 type of antenna using a pocket

calculator. Then I obtained access to a computer and tackled the much longer calculations of the Double-V and U shapes.

The mutual impedance between two antenna elements, say a driven element numbered 1 and a reflector numbered 2, is obtained from:

$$Z_{12} = \int -E_{12} \sin(2\pi S) dS$$

Where E_{12} = the intensity of the electric field due to 1 amp input to the driven element, at a point on the reflector a distance S from one of its ends, and parallel to the reflector at this point.

The integration indicated by this equation simply means that, if a curve is plotted of $(-E_{12} \sin 2\pi S)$ against S , then Z_{12} is equal to the area under this curve. It is interesting to note that, to get each value of mutual impedance, Brown had to plot such a curve and measure the area with a planimeter. Numerical integration with a computer is now the method.

The electric field surrounding the driven element cannot be easily

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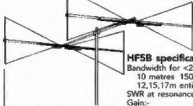
HF6V-X specifications:

Bandwidth for < 2:1 SWR—
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15 metres entire band
20 metres entire band
30 metres entire band
40 metres 280 KHz
80/75 m. 40 to 100 KHz

HF9V-X specifications:

Bandwidth for < 2:1 SWR—
6 metres 1MHz
10 metres 1500 KHz
12 metres 200kHz
15 metres entire band
17 metres 200kHz
20 metres entire band
30 metres entire band
40 metres 280 KHz
80/75 m. 40 to 100 KHz

SWR at resonance: <1.5:1
Power handling: 1.5kW
Feed impedance: 50Ω
Wind load: 49m²
Wind survival: 129kph
Height: 7.9m
Weight (HF6VX) 5.4kg



HF5B specifications:

Bandwidth for <2:1 VSWR—
10 metres 1500kHz
12, 15, 17m entire band
SWR at resonance: <1.5:1
Gain—

10 metres 5dBd
12 metres 5dBd
15 metres 5dBd
17 metres 0dBd
20 metres 3dBd
Front to back ratio: 20dB
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pictured, and four equations are needed to describe it mathematically. Two of them give the real and reactive components of the field intensity parallel to the driven element, and the other two give the real and reactive components perpendicular to the driven element. The reactive component appears because of time phase differences.

For the normal Yagi, only the electric intensity parallel to the driven element has to be calculated, since it is parallel to the reflector also. But if the reflector is bent, the intensities parallel and perpendicular to the driven element are needed to calculate the total intensity parallel to any section of the reflector.

Figure 5 gives an idea of the four components of the electric field produced by a straight half-wave dipole. Figure 6 shows curves of $(E_{12}\sin 2\pi S)$ plotted against position

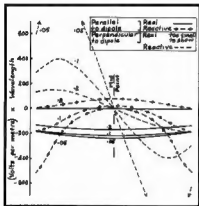


Figure 5 — Electric field components at distances of .05, 0.1, 0.2 wavelength from a straight half-wave dipole with 1 amp input.

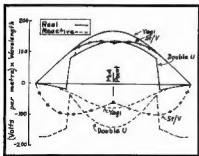


Figure 6 — Real and reactive components of $(E_{12}\sin 2\pi S)$ plotted against position along reflectors of Yagi, Straight/V 103 degree, and Double-U beams. All elements spaced 0.2 wavelength. 1 amp input.

along the reflector for a Yagi and two bent beams. The net area between the curves and the base line is proportional to the mutual resistance or reactance as the case may be, and examination of them shows which parts of the reflector contribute most to the change in resistance or reactance when the reflector is bent. It is not just the parts near the open ends that affect the mutual reactance as is often thought.

Self Impedance

Self impedance is computed in much the same way as the mutual impedance, except that the electric intensity is that due to the current in the element itself, not in a coupled element. Only the resistance component was needed for my purpose.

Checks on Impedance Values

The performance graphs of Figure 1 in Part 1 are no better than the impedance values used in the computations and it was vital to get some check on them, apart from the usual checks on programs, etc.

I was pleased one day to come across a graph in Ref 8 of the self resistance of a V-shaped dipole plotted for a range of angles, and this agreed closely with the figures I had computed. Ref 4 gives the self-resistance for a range of shortened straight dipoles, and these figures gave a reasonable check on my figures for the Double-U designs.

No figures came to light to give a check on mutual impedance between

bent elements. Exact agreement with published figures for straight elements was only a partial check since, in this case, the large reactive field components perpendicular to the driven element are not involved.

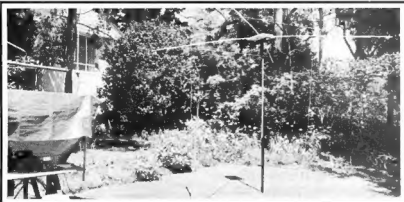
Being confident about the self-resistance values for a reflector, it occurred to me that a check on the magnitude of the mutual impedance, although not phase angle, could be obtained by setting up a test bent-beam with a self-resonant reflector and measuring the current-ratio. As shown earlier, this ratio is equal to the ratio of the mutual impedance to the self-resistance of the reflector.

The first test was with a straight driven element and a V-shaped reflector. Then, some time later, when I had extended the computer programs to handle a Double-U type, a second group of tests was performed on this type of beam (see photo of VK2ABQ type of structure). All tests were done in the 10 m band, measuring the currents in the driven element and the reflector with toroidal current transformers/rectifiers. In the double-U series, measurements were made with spacings between the tips of the elements ranging from 10 mm to 290 mm. This variation was achieved by changing the spacing between the elements. Included in both series of tests was a normal Yagi for comparative purposes.

Table IV shows a comparison between computed and measured current-ratios. Taken overall, the agreement between computed and test figures was good enough to give me the final bit of confidence I needed.

Shape of elements:		Spacing between:		Current Ratio:		Current Ratio rel to Yagi:	
rflr	drvn	elements	tips of elements	computed	test	computed	test
strl	strl	.2λ	-	.75	.65	1.0	1.0
strl	103° V	.2λ	-	1.3	1.0	1.7	1.6
strl	strl	.258λ	-	.7	.65	1.0	1.0
U	U	.258λ	290 mm	1.2	1.0	1.75	1.6
U	U	see text	65 mm	1.45	1.35	2.1	2.15
U	U	see text	27 mm	1.55	1.4	2.25	2.2
U	U	see text	10 mm	1.6	1.5	2.3	2.35

Table IV — Comparison of calculated and measured Current Ratios for various antennas. The second set of readings represents the second series of experiments.



Tests being carried out on the author's VK2ABQ type antenna.

Concluding Remarks

Although now satisfied that many of the performance claims that originally attracted me to the V-5 design are not supported by theory, the concept of using a trapped tubular driven element with full-length wire parasitics still appeals to me for its simplicity and light weight. Provided it is fitted with a director as well as a reflector for each band, making a symmetrical layout with little

or no increase in turning circle, its performance should be comparable with the usual tribander. As for some of the theoretical results in this article being at odds with others that have received fairly wide recognition in amateur radio circles, I point out that, to the best of my knowledge, figures for the mutual impedance between bent elements have not previously been determined. Mine being just an amateur effort, verification of these

figures by test is clearly called for. I have done what I could with limited resources and I believe that the computed impedances are sufficiently correct for a broad comparison of beams. Nevertheless, my hope is that others may be able to go further with better instrumentation and more space. My attention was recently drawn to the RSGB book *HF Antenna Collection*, which has a chapter on modelling and testing, including some very excellent work carried out by G3LDO at 144 MHz with small scale models of HF antennas. His efforts show what a fruitful field this is for antenna experimentation — better still if it can be accompanied by theoretical analysis!

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6. P S Carter, Circuit Relations In Radiating Systems, *Proc IRE*, June 1932.
7. G H Brown, Directional Antennas, *Proc IRE*, Jan 1937.
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JOTA

37th Jamboree-On-The-Air

Scout Commissioner Peter Hughes VK6HU, National Co-ordinator for JOTA, encourages all amateurs to participate in the 1994 Jamboree

Jamboree-On-The-Air is the biggest event in the world calendar of the amateur service, especially in Australia. It is one week-end in the year when amateurs invite scouts and guides to talk on the air to other scouts and guides "elsewhere".

Early rapid increase had 30,000 international participants by 1961 and IT IS STILL GROWING. Although in the past few years we appear to have reached a plateau of numbers in Australia, world numbers have grown by an enormous 30% in two years — by 11.5% from 1991 to 1992 and another 17.5% to 1993.

The Numbers Are Interesting Too —

In 1993, 429,000 Scouts and 88,000 Guides took part in JOTA at nearly 11,000 stations run by 33,500 radio amateurs in at least 104 countries

around the world. This is the first time over 100 countries has been reported and it represents 98% of members of the World Organisation of Scout Movements. It is the first year that over 500,000 have taken part. No wonder the air waves were crammed that week-end! Truly, it is an international event.

Some of this latest rapid increase is due to nations emerging from behind the iron curtain with their young people rejoining scouting and embracing JOTA. They are fascinating to talk to and are hungry for information on our activities. It is very rewarding to be part of this excitement.

In Australia

Scouts have participated in all 36 Jamborees-on-the-Air. In 1993, 1344 amateur callsigns were active at 653

JOTA stations looking after 15,459 Scouts, 2,368 Leaders, 8,135 Girl Guides and 1,429 Leaders who recorded 8,207 visitors to their activities. When all the reports were tallied those numbers reflected a 9% increase in Scout and Guide participation over 1992 and operators made nearly 7,000 contacts, well down on over 10,000 contacts made in both 1990 and 1991, but 5% up on 1992.

Regulations have always allowed Australian Scouts and Guides to speak directly over the air (under licensed supervision of course) and overseas scouts are still gaining this privilege. We are deeply indebted to the SMA for their constant help and consideration.

How to Take Part

- Agree to operate your station at a Scout or Guide Hall or camp or invite a few scouts or guides at a time to your shack, perhaps on roster?
- Offer to help at another station.
- If you can volunteer, please ring Scout HQ in your capital city for your JOTA organiser, or a deputy, to make some arrangements and contact you.
- If you know your local Scout Group or Guide Unit, please go straight to them.

There are a Few Rules

- The 37th JOTA week-end is 15 and 16 October 1994.
- JOTA is not a contest; quality of contact is the most important factor.
- Stations operate within the licence of any operator present using any legal frequency or mode. JOTA provides an opportunity for holders of Limited and Novice calls to work within a Full Call licence when one is present.
- Stations may operate for 48 hours or any part thereof (dependent on time availability of the operator) from Saturday 0000 hrs to Sunday 2400 hrs LOCAL TIME. This means that all stations around the world could be active for the full 24 hours from 2200 hrs EAST Saturday.
- Call "CQ Jamboree", or answer JOTA stations calling, to establish

37th Jamboree-on-the-Air 37e Jamboree-sur-les-ondes



The 1994 International JOTA Logo.

a contact ("CQ JOTA" is also used)

It is recommended that stations monitor the agreed World Scout Frequencies and call around the dog pile to find each other. This process helps to avoid losing a contact in a QSY away from a spot frequency, but please QSY if you do "spot" on these frequencies. Please leave intervals for DX stations to come in

World Scout Calling Frequencies

Band	CW	DX Phone	VK Phone
80 metres	3.590MHz	3.740MHz	3.590MHz
40 metres	7.030MHz	7.090MHz	7.090MHz
20 metres	14.070MHz	14.290MHz	14.190MHz
17 metres	18.080MHz	18.180MHz	
15 metres	21.140MHz	21.360MHz	21.190MHz
12 metres	24.910MHz	24.960MHz	
10 metres	28.190MHz	28.950MHz	28.580MHz

(< - not legal in Australia)

(VK frequencies are also advertised in ZL)

Official Opening of 37th JOTA

The official opening of JOTA for Australia will be broadcast as usual over VK1BP from Government House Canberra at 0400z on Saturday, 15 October 1994 on frequencies of 7.090 MHz, 14.190 MHz and 21.190 MHz. Testing is necessary, so it would be appreciated if the broadcast frequencies were kept clear from 0330z. Following the broadcast a "callback" is taken to give our dignitaries some idea of the enormous scope of JOTA in Australia. I will take this on each frequency in turn, returning to the frequencies in turn until there are no more callers or by 0500z.

Good luck with JOTA and 73

*58 Preston Street, Como WA 6152

BT

**Repeaters —
additions, deletions,
alterations. Have
you advised the
WIA of changes
needed to the
repeater list?**

Equipment Review

ICOM IC-2700H VHF/UHF FM Transceiver

Reviewed by Paul McMahon VK3DIP

What is it?

The IC-2700H is a feature packed dual-band 2 metre/70 cm FM transceiver, offering 50 watts out on 2 metres, and 35 watts out on 70 cm. It is intended for mobile operation, but would also be at home on the shack bench.

First Impressions

The IC-2700H comes packed in the standard type foam box inside a cardboard box. The first thing to be noticed with the IC-2700H is the sparseness of the front panel. Those controls that are on the main unit are symmetrically placed befitting the dual band role. This effect is supported by the display which also has two halves, one for each band. The controls on the panel offer the basic for each band; that is, there are

two each of volume, squelch, and frequency/memory knobs, plus a couple of buttons. There are also a few other buttons such as power, Tx low power, duplex, and scan, which have a common function and are thus not duplicated. It should also be noted that the knobs also function as buttons if pushed.

The microphone is also pretty remarkable. It has the most buttons, etc on a microphone I have ever seen. There are some 30 buttons on the microphone compared to the 10 buttons and 4 knobs on the main box! Basically, anything you can do from the front panel you can do from the microphone. This includes power, volume and squelch settings. However, there are, in fact, quite a few functions which can only be done from the microphone.



IC-2700H VHF/UHF FM transceiver. Note the uncluttered front panel compared to the many facilities offered by this rig.

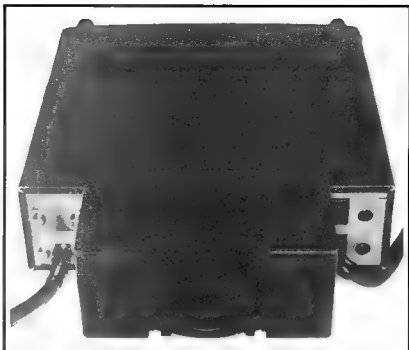
The internal speaker is mounted on the top of the set, and the single antenna connector shared by both bands has a PL259 connector on a short length of coax. The microphone is connected via a flat plastic connector similar to the RJ11 type of click-on connector commonly used on telephones. The microphone socket is hidden behind the removable front panel. This is something I actually had to look up in the manual to find out, as it had me stumped for a while. There is actually a good reason for this as one of the options is an infra-red remote wireless microphone and, if you chose this option, you wouldn't want the front panel left with a gaping hole. The LCD display is large and shows all there is to know about the transceiver in stereo (information for both bands is shown simultaneously). Unusually this includes the current setting of both volume and squelch controls.

The back of the unit has two standard 3.5 mm speaker jacks which can be programmed to provide one or both audio channels. Completing the back is a reasonably small heat sink with attached fan. This fan can be set to be on continuously or only while transmitting. When on the fan is fairly quiet and maintains the heat sink at a tolerable temperature.

The IC-2700H is functionally similar to the older IC-2400. The main differences being a much cleaner layout with the dual controls and symmetry mentioned above, slightly improved receive sensitivity (0.16 μ V for 12 dB SINAD vs 0.18 μ V), slightly higher power out on 2 metres (50 vs 45 Watts), more memories (50 per band [100 total] vs 40), and smaller size (140 x 40 x 175 mm vs 150 x 50 x 195 mm).

Technical Bits

As appears usual these days there is very little technical content in the manual. Details are restricted to the usual sketchy specs hidden up the back, from which you can glean that the receiver is a dual conversion with the first IF at 41.8 MHz (42.25 MHz at 70 cm) and the second IF at 455 kHz. The 88 page manual is, however, a detailed instruction book explaining clearly how to use any of the functions. This doesn't help, however,



The rear view of the IC-2700H shows the comparatively small heat sink and cooling fan.

if you are interested in how ICOM has achieved some of the magic functions of this rig.

In the review set the frequency display showed a receive frequency range from 118 MHz to 174 MHz and 320 MHz to 999 MHz in 5 kHz steps. Time and equipment restricted my exploration of the actual receive limits of the set, but transmit was limited to the relevant amateur band segment as noted in the specifications.

One of the bits of magic I would be interested in some details of, is the ability of the set to program both halves as either band. By this I don't mean just swapping which side of the display and knobs are which band; I mean that each half can be independently set to either of the bands or off. This leads to the basically useless ability to turn one half off, and the very useful ability to have both halves on the same band at the same time! ICOM calls this the para-watch mode. I tested this by putting both halves on 2 metres, and lo and behold I was listening to two frequencies on the same band at the same time with the same radio.

This is not the more common priority-watch function (which is also

available on this set) where the receiver switches every so often back and forward between two channels. In the para-watch mode, as far as I could determine, it was exactly as if you had two 2 metre boxes in the same shell. If both frequencies were in use you heard both stations at once, and you could talk to both as well. The only difference I could find between the two halves when on the same band was that one half was a couple of S-meter points down on the other, which was easily seen by setting both to the same frequency. This mode could be very useful. Imagine talking to someone on the band, while scanning the same band.

Another bit of more useless, but never-the-less eye catching, gimmickry is the demo mode. In this mode the display cycles through a series of pretty patterns, and effects. This is stopped as soon as a button is pressed, but is activated again after 2 minutes inactivity. If you are into screen savers on your PC then this mode is just what you want in a radio.

Some of the other more useful features are:

- The programmable time-out for transmit, just like a repeater time-

out except that it beeps at you ten seconds before it is going to cut you off.

- One touch PTT, is effectively a locking PTT key. If you use it, however, its probably a good idea to also set up the time-out.
- Auto power-off. Good for people who leave the radio on in the car and flatten the car battery
- Scratch pad memories. The transceiver remembers the last three frequencies you used, similar to a last number redial on a telephone.

The IR (Infrared) wireless microphone option sounds like a useful option too. The range quoted is around 2 metres, with greater distances possible with an optional extension receiver. The only problem with this is that if you have a messy shack bench you may end up misplacing the microphone! At least with the normal approach you can find it by following the curly cord. If you are the type who likes to pace about while talking, or has a curly cord that has been stretched to twice normal length by having people in the back seat of the car wanting to talk, then this could be a very useful option to consider. It appears you can set up to 8 different microphone addresses also, so if you have more than one of these sets, say at a field day or similar, you can determine which box goes with which microphone.

Another difference to get used to is the need to look at the microphone as well as needing to use some care when selecting features. There are a couple of multi-colour LEDs indicating which buttons have been pressed, etc, although I must say I would probably never remember what the difference was between the mode LED being red, green, or orange. At least if you were in a car you could hold it up in front of you rather than taking your eyes off the road. The IR wireless microphone also has all of these buttons, as well as the nicads, etc to power it. This would make for a solid microphone and I suspect that the standard microphone that is supplied actually has some weights included to match it to the feel of the wireless one.

The scanning features are well explained in the manual, with diagrammatic, as well as written, descriptions. These features are pretty much standard these days and can just about be taken for granted. Various repeater needs that are not really required or useful in Australia are also present, such as tone access, auto offset, and DTMF dialling with memories.

Despite all the bits on the microphone, audio quality was good, and setting up the memories, etc was quite simple, or at least it seemed so when following the manual. Switching between bands, and setting the main

and sub band, was also fairly obvious. As far as main and sub band are concerned the only reasons I could see for designating the bands as such was to facilitate which band the buttons on the microphone were active upon. In all other respects the two halves of the set seemed to be equal

Power supply requirements should be looked at carefully, especially if you are intending to use this as a base rig. The 12 amps maximum required on transmit is easily in the league usually reserved for HF boxes. Likewise this could make quite a mess of a car battery if the engine was not going for a while. If you were, for instance, to park on a hill for an all day field day, make sure you leave the car facing downhill.

Conclusion

This is a set with which to really impress your friends. It has virtually everything you could ever ask for, and a bit more for luck. The decision to keep the front panel simple, and to put everything on the microphone is a bit different but it does have some advantages. This is not really a dual-band. It is much more like two separate transceivers in the same box.

The review transceiver was supplied by Duncan Baxter from ICOM Australia Pty Ltd.

**47 Park Avenue, Mittle Glen, VIC 3008*



Operation

Operation is pretty straight forward. Basic things, like turning the power on, or setting volume, squelch, and frequency, of each band, at least via the front panel, are fairly obvious. The microphone is another story. This is one complex microphone! Most of the quite large manual deals with the use of the microphone and its buttons. The microphone feels a little strange in the hand with all those buttons (as previously mentioned there are 30 of them, most with two functions and some with three) However, some thought has gone into the placement of the buttons to minimise possible problems. To help with this there are two different lock buttons on the microphone to lock the buttons on either side of the microphone independently.

WIA News

Radio Direction Finding Championships

Frank Sleep VK4CAU has provided an update on our July WIA News item on the upcoming radio direction finding championships in Europe.

This competition is to be the 7th World Championships, not the Region 1 Championships, as previously stated. Frank VK4CAU will be attending as Australia's only competitor, apparently the first time

Australia has been represented in any world championships.

Radio Sport is coming to Australia, says Frank, probably first to VK4. It seems the Townsville Amateur Radio Club is considering submitting a proposal to conduct the next Region III ARDF games here. Frank suggests we need a Federal ARDF Coordinator, saying it would be a tremendous boost to the WIA if the Year 2000 World Championships could be held in Australia, perhaps as a demonstration sport for the Olympics.

1994 Remembrance Day Contest

Opening Address



Mr Richard Butler, AM.

The Opening Address

"I am greatly honoured to be invited again to participate in the opening of your annual Remembrance Day Contest and to remember with you those who served and gave their lives in the national and global interests of others

"We live, today, in an environment which is becoming increasingly complex, leading to a more integrated society. A communications revolution is under way. It is as significant as the industrial revolution which preceded it.

"Digitalisation is driving convergence. Potential applications and new acronyms and descriptions appear regularly with many like "super highways" driven by the supply side. Nevertheless, thanks to wireless advantages and advances, we can recognise that in less than 30 years Marshall McLuhan's global village concept has now arrived.

"With the results of WARC '92 we can truly say that it will soon be practicable to have quality communications in large or small — even single circuit capacities from person to person — anywhere to anywhere. Digitalisation and low earth orbit satellites are adding to network connections, facilitating access beyond other technology frontiers. This is not new to amateurs.

"Indeed, amateurs have helped to pave the way in using orbiting satellites, providing novel software, store and forward and other uses proceeding from the earlier packet radio and RTTY initiatives.

"Those initiatives have laid the foundations for other groups, like Volunteers in Technical Assistance (VITA) which has received a FCC Pioneers preference status licence for a Low Earth Orbit Satellite (Little Leo) system, serving humanitarian disaster relief. One example is "the world's first use of a low earth orbiting satellite to remotely control a

technical system", monitoring the operations of a renewable energy power plant now serving some isolated schools and residences away from the public telecommunications and electricity grids in Indonesia.

"The last occasion on which I addressed you was virtually on the eve of WARC '79 which was in my capacity in the ITU and patron of 4U1ITU, following the interests of amateurs rather closely.

"With sustained preparations in various WARCs it was satisfying to see the recognition given in the International Radio Regulations to the "Amateur Service" and the "Amateur Satellite Service". This is far removed from the initial experimental licences granted to Walter Jenvey, T Robinson, C P Bartholomew and others who pioneered wireless applications at the turn of the century. Walter Jenvey, with his communications to the Royal Escort Cruiser, was, in fact, a pioneer for the maritime mobile service.

"Your history is full of pioneering training contributions earning the credible recognition which has stood the amateur community well in the national and international negotiations on the competing demands for radio spectrum and shared access.

"We are in an era of competitive uses and consideration of the economic values of the spectrum for particular service applications. They present new challenges in policy formulations and decisions. It will be important for the amateur service values to be fully appreciated in the future spectrum allocation reviews at both national and international levels.

"I wish you every success with the 1994 Remembrance Day Contest and in future amateur activities across all facets of radio spectrum considerations that will be faced for the rest of this decade.

"I now declare the 1994 Remembrance Day Contest Open.

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**Prevent pirates — make
sure you sell your
transmitter to a
licensed Amateur.**

SEANet Says "Make It Malacca"

Thomas E King VK2ATJ

Malaysia's most historic city, Malacca, will host the 22nd annual convention of the Southeast Asia Network (SEANet) from 11 — 13 November, 1994.

The SEANet '94 organising committee anticipates that 200 amateur radio operators from a dozen countries will register to attend the three day event. As well, a number of communication officers and telecommunications executives, shortwave listeners and others interested in amateur radio and electronics will also likely register for this popular forum for amateurs in South East Asia and Oceania.

The venue for SEANet '94, the Village Resort, Ayer Kroh, is also expected to be the site of a special event amateur station operating on HF and VHF.

The registration fee of \$US60 (\$AUS82) includes meals and activities in the conference program plus souvenirs. The room tariff will be about \$US50 (\$AUS68) inclusive of breakfast.

A number of SEANet '94 events have been organised including a welcome dinner at the Village Resort and a lineup of sightseeing tours in and around the fascinating city.

Malacca (locally known as Melaka), 146 km south of Kuala Lumpur and easily accessible from Singapore, was founded in the 15th century. The flags of Portugal, Holland and England have flown over Malacca which today lures millions of visitors from around the world to sample its multicultural heritage.

Following the conference, delegates able to tour the nation will find a dynamic country in the midst of celebrating "Visit Malaysia Year 1994", a year long celebration of some 160 special events staged across the length and breadth of Malaysia.

Further details about SEANet '94 are available from Organising Secretary, Sangat Singh, 9M2SS, 111, Jalan Terasek Lapan, Bangsar Baru, 59100 Kuala Lumpur, Malaysia, tel (603) 256 1571, fax (603) 253 7373.

Amateurs can also check into the SEANet which meets daily at 1200z on 14.320 MHz to not only learn about the activities of the net and the upcoming conference but to also learn more about VMY '94 and the many attractions of this booming southeast Asian nation.

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WIA News

80 m DX Window — Take



With the trough in the Sunspot cycle comes improved propagation on the lower HF bands. Naturally, there is increased interest in the 80 metre band DX window.

The band from 3794 to 3800 kHz was made available to full call VK stations to allow them to work DX. However, the window is very narrow and includes a 1 kHz "guard" band on its lower edge.

WIA Federal Technical Advisory Committee (FeTAC) chairman, John Martin VK3KWA, says some poor operating habits are being observed on this band.

These bad habits include long conversations which deny others access to the window, and a high incidence of out-of-band operation. He notes that operation on 3795 kHz lower sideband is very common and points out that such operation is totally out of band, because the sideband falls below the band edge.

Take care!

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WICEN Training Conference — From Two Points of View

The role of WICEN is changing with the current organisation of the Emergency Services in NSW. It is necessary for amateurs who wish to assist in emergencies to be better trained and fully able to integrate immediately with the "formal" services.

With the advent of the Government Radio Network, which is currently being instituted, providing complete interconnectivity between the "Combat Agencies", WICEN is re-examining its response capability.

As a step in this direction a Training Conference was held at the NSW Police Academy in May 1994.

Here are two points of view of that conference.

John Howard VK2AMH
VK2 WICEN State Co-ordinator

First — the WIA Federal Councillor

*by Richard Jenkins VK1RJ,
VK1 Division Federal Councillor*

I attended this conference, held at the Police College, Goulburn, NSW on 14 and 15 May 1994, as a representative of the WIA.

Nevertheless, I was made very welcome and was a full participant for the time I was able to be there. What follows is not an account of my stay, but rather my impressions of the event.

Approximately half of the VK2 WICEN area leaders from around the state were in attendance. This made a group of approximately 26 to 28 people, with a wide cross section of the state represented. I spoke with controllers from Hunter, Central Coast, North Coast, etc. etc. I gather more would have liked to come but, for family or business reasons, they found it difficult to give up an entire weekend and travel to Goulburn.

The theme of the day was PLANNING, and John Alcorn gave an excellent two-part presentation on the importance of planning. At the end we all knew that planning was essential SO THAT NOTHING WAS LEFT OUT!!! Seriously, John's extensive experience in the armed forces and in WICEN gave him the right background to really ram home the importance of planning before rushing off into "combat".

This was important, because Leigh Baker and David Tilson had organised a three part training scenario for us to work on in syndicates. Wouldn't you know it? We rushed in, all thought of John's words being forgotten! Still, we were more thoughtful on the second part. An excellent training exercise! With the help of John Howard, Leigh and David put on a polished performance as, first of all, the instigators of the call out and then the local EEC committee. All participants and the watchers quickly gained the essential points. Wonderful stuff! It's apparent that Leigh and David have done this before! (They have, for VK3!)

Nicely inter-mingled with this were talks from Joe Barr (Director Planning for Emergency Management Australia) and Dieter Gescue (from NSW SES). Leigh gave a talk on his ideas for the Australia-wide co-ordination of WICEN training and information networks. If we get progress in these areas then there is a clear benefit for the nation (in times of emergency) and protection for individual WICEN members. It is apparent that, in VK3 at least, WICEN has been able to forge strong links with other emergency services and to establish a visible public profile. This expertise needs to be shared with the other states through training exercises like this one.

I came away feeling that there were steps that should be taken in the ACT to raise our WICEN profile, that the Federal WICEN Co-ordinator was co-ordinating groups on most worthwhile tasks, that some agreements between the various state leaderships of WICEN could be hammered out (in regard to training, use of standard forms, co-operation, etc) and that WICEN had an overall strategy and direction for the future.

Towards the end of the day I was asked to give a "Federal Report", whatever that may be. I made some notes, and spoke pretty much to them. I stressed the value of WICEN to the community and linked it to the future of our hobby. I mentioned our bid to get the Year 2000 IARU conference for Australia. I drew a parallel between the WICEN bulletin board information links and proposals



Syndicate Exercise — (l to r, clockwise around the table) Steve Johnson VK2XNH, David Horsfall VK2KFU, Pauline Jones VK2GTE, Roger Baker VK3BKR, Alan Whitmore VK2YYJ, Annette Wilkinson (Associate) and John Knight VK2JGK.



WICEN NSW receives a portable Codan radio, donated by the Civil Aviation Authority. (l to r) Greg Wilson VK2DIL, John Howard VK2AMN, State Co-ordinator and Leigh Baker VK3TP, Federal WICEN Co-ordinator.

for something similar for the WIA and its Divisional members.

My impression was that what I said was well received, and that this was the first time most of them had seen or spoken with any Federal Councillor. I spoke as a representative of "Federal", but I fear they have me set down as the VK1 representative for WICEN!! I must straighten that out with my committee ASAP

A most excellent training weekend. I was sorry I could not stay for both days. I would support the extension of this training to other Divisions and to those WICEN leaders who could not make it for this weekend.

Second — the WICEN Participants Viewpoint

by Mark Cheeseman VK2XGK, WICEN Sydney South

You're awakened at 2.30 am by the phone ringing. The town of Putty has been hit by an earthquake and all communications into and out of the area have been disrupted. When a herd of foot-and-mouth infested cattle

SOME THINGS HAVE NO COMPARISON

amateur
radio
action

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break out of quarantine, swift action is called for in order to save Australia's rural export industry.

No, it's not the outline of a script for *A Country Practice*, but a scenario concocted for the benefit of attendees of the annual NSW WICEN training conference. Once a year, WICEN members from all over NSW gather at the Goulburn Police Academy, for a weekend of simulated mayhem and disaster.

Originally called the WICEN Coordinators' Conference, in recent years it has been opened up to attendance by any interested member of WICEN NSW, and is a valuable event for anybody who is interested in the finer points of emergency communications. This was my first WICEN Training Conference, so I can't compare it to previous years, nor to similar events held by other Divisions.

The emphasis of the weekend is clearly on the administrative side of emergency communications, not playing radios. Operational and technical expertise are taken to be "assumed knowledge". WICEN operators get plenty of opportunities to hone their radio skills and voice procedure throughout the year. The training conference is aimed at honing those management skills which a WICEN coordinator is expected to have, but which rarely get exercised except in a real emergency,

by which time it's too late to deal with any shortcomings.

The earthquake exercise was the feature piece of the weekend, occupying a total of six hours, split into three sessions. At the beginning of each session, a brief role play was acted out to the entire group, after which the attendees separated into four syndicates, each of which worked out their response to the situation.

After each session the groups met back in the lecture room, where a spokesperson (or two) from each syndicate presented their solution to the entire group. The first part of the exercise involved presenting a plan for initial response; the second was to brief the heads of the various services at the Emergency Control Centre on WICEN's capabilities; and the third dealt with the foot-and-mouth outbreak, and the need to communicate while minimising the chance of the outbreak becoming widely known.

In addition to the group exercises, there were presentations from a number of authorities on the subject of emergency management. John Alcorn spoke on "occurrence appreciation and operation planning", how to coordinate a WICEN response to an emergency situation.

Dieter Gescue from the SES and Joe Barr, Director of Planning, Policy and Co-ordination at Emergency

Management Australia, each gave an insight into the operation of their organisations, and related some interesting first-hand experiences in emergency operations. Ray Williams, a well known print and radio journalist (now retired) spoke on WICEN and the media, and gave advice for dealing with the inevitable media interest that accompanies emergency situations.

Finally, David Thorncraft and David Tilson reported on their recent activations during the Central Coast bushfires and Victorian floods, respectively, and the particular problems which those operations presented.

David Tilson also described in detail the ADMIN disaster management network, which links many emergency services together nationwide through computer bulletin boards. He also discussed some of the Internet services that are available for those interested in disaster management. (The Internet is a global computer communications network consisting of some two million (+/-) systems, and is a vast source of information in all manner of subjects, if you know how and where to look). At least one NSW member left the conference convinced that the time had come to invest in a modem for his computer.

Finally, it would be remiss of me not to acknowledge the effort put into the planning of the weekend. Morton Williams, John Howard, and Brett Wilkinson obviously spent many long hours making sure the weekend was as beneficial as possible, and the smoothness of the weekend's events was testament to the detail of their planning. Not to mention the efforts of Leigh Baker and David Tilson in dreaming up the earthquake exercise.

All in all, it was a weekend well spent, and I for one will be there next year. But this time, I'll travel down on Friday night, so I can awake refreshed on Saturday morning ready for a hard day's work. Getting up at 4.30 am and driving down on the Saturday this year left my brain a little the worse for wear come Saturday afternoon, and there was still Sunday to come! There was no time to sit back and relax at this conference.



Group photo of the attendees at "Goulburn 94".

The idea is from "Technical Topics" in the May 1988 issue of *Radio Communication* and the original source was Brian Smith GWOIER. The device is shown in Fig 2. The paper clip is unfolded and at one end a length of 2 mm is folded back to form a hook. The other end is formed into a loop through which you can pass your finger.

Later a modification appeared which was to sharpen the hooked tip so as to make it easier to slip under component leads which were close to the printed circuit board. A very useful and cheap tool.

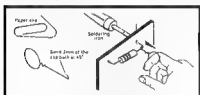


Fig 2 Handy Component Puller

50 MHz Coaxial Stub TVI Filter

The 50 MHz band is prey to TVI due to the harmonic relationship with both the FM broadcast band and TV Channels 9 and 10. For FM broadcasting the second harmonic is the problem. TVI is due to the fourth harmonic.

A simple quarter wave coaxial stub can be used to reduce harmonic output. This was explained in "Technical Topics" in the October 1987 issue of *Radio Communication*.

The simplest arrangement is a short circuit quarter wave stub as shown in Fig 3. This will need to be modified for local conditions as our bands are slightly different. See Table 1 for lengths for local use. The RG series cables have a 0.66 velocity factor and the stub should be cut for either SSB DX or for the FM area above 52 MHz. The T connector is connected to the radio coaxial output connector. The antenna is plugged into one side and the quarter wave stub is plugged into the other side of the T connector.

For stagger tuning, or to get greater rejection, a double stub design as shown in Fig 4 can be used. The attenuation characteristic is shown in Fig 4. The notch repeats at the fourth harmonic which falls in the TV channels.

This is a simple device which can give you some worthwhile protection from TVI. All it takes is a scrap of cable, a connector and a T connector.

Table 1 Quarter Wavelengths of Coaxial Cable

Frequency	0.66 Velocity Factor	0.67 Velocity Factor
50 MHz	990 mm	1015 mm
50.1 MHz	988 mm	1012 mm
52 MHz	952 mm	976 mm
53 MHz	934 mm	958 mm
54 MHz	917 mm	941 mm

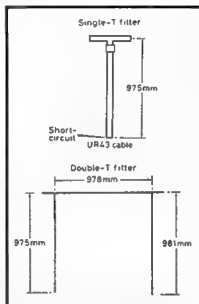


Fig 3 Single and double 100 MHz quarter-wave coaxial stub filters for use with 50 MHz transmitters to suppress harmonic interference.

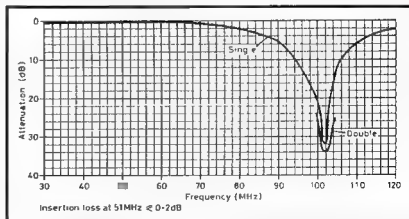


Fig 4 Measured attenuation characteristics of the 100 MHz stub filters. The double filter is stagger tuned to increase notch bandwidth rather than to increase attenuation.

Tone Modulated HF Noise Bridge

The HF antenna impedance bridge using a broad band noise source is popular as an aid to checking antenna matching. Tone modulation of the noise is often used as an aid to discerning the null. This complicates the bridge circuit as you need to provide a tone source as well as the noise source.

A simple noise bridge circuit which provides tone modulated noise with a minimum component count was published in the June and July 1994 issues of *Radio Communication* by E Chicken G3BIK. This was accomplished by recognising the similarity between a multivibrator and a two stage amplifier with feedback from output to input. The multivibrator circuit is shown in Fig 5 and the two stage amplifier with feedback is shown in Fig 6.

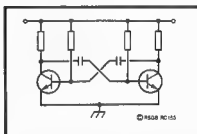


Fig 5 Classical Multivibrator Circuit.

The noise bridge uses a two stage amplifier to amplify the noise source. So, by some careful configuration of

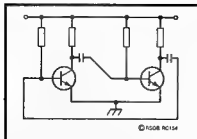


Fig 6 Two Stage Amplifier Modified as a Multivibrator.

the circuit, the amplifier can both amplify the noise and act as a multivibrator to produce the tone. The circuit is shown in Fig 7. The bridge circuit is fairly standard and the modification to produce tone modulated noise is simple.

The author used a transistor radio tuning gang as the variable capacitor. This should be stable enough for the purpose. The potentiometer used was one with a plastic spindle. Plastic

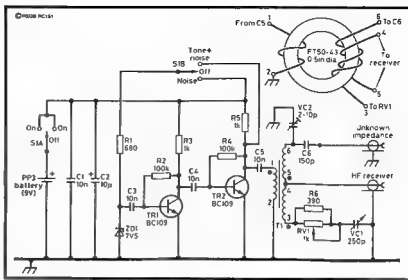


Fig 7 Noise Impedance Bridge Circuit Diagram.

knobs on both controls should allow adjustment without troublesome hand capacity effects. The zener diode is a standard 400/500 mW type.

All components should be available locally. A PP3 battery is known here as a 216 battery and is a standard type.

WIA News

New Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of July 1994.

L20976	MR J M STACY
L20977	MR B J WARHURST
L20978	MR D G COOPER
L30892	MR J WATSON
L30893	MR R HENSHAW
L40355	MR N H PARKER
L40356	MR J A DEVLIN
VK1PT	MR N J LAWRENCE
VK21XX	MR J P ASQUITH
VK2JRB	MR J R BUGLER
VK2KBN	MR B A NEWMAN
VK2LYN	MR M T PERRY
VK2MSC	MR S D SALMON
VK2TFP	MR I CHENNEL
VK2TGA	MR J CHARLTON
VK2UPP	MR P J PHILIPPA
VK2ZON	MR R ROBINSON
VK3FAU	MR C WESTWOOD
VK3FBL	MR K WETTER
VK3HK	MR S BUSHILL
VK3MCK	MR G PADVAN
VK3TRP	MR F FINEBERG
VK4AHC	MR P J HELBIG
VK4AJA	MR A J PARR

VK4ARQ	MR R J MULLER
VK4CIB	MR I J BECK
VK4MRT	MR R R TANNOCK
VK4WHS	MR W H S STACEY
VK5GY	MR J C EASTAUGH
VK6KDC	MR D J CHURCH
ZL2WOG	MR P F HARRIS

Electro-magnetic Compatibility Standards

New Australian standards to curb electro-magnetic pollution from electrical and electronic products will be in force by 1 January, 1996.

Communications Minister, Michael Lee, says that radiation limits are to be imposed on a wide range of products. The Minister says, at the same time, that "immunity" levels will be set for other products so that they will resist the effects of electro-magnetic pollution.

The timing of the federal government's announcement on electro-magnetic compatibility (EMC) standards in Australia coincides with an identical move by the European Community, and

a world-wide focus on the problem.

The lack of mandatory immunity standards had, in recent years, left the door open for television receivers to be imported, which are susceptible to interference from other signals, whether these arise from legitimate transmissions or unwanted electro-magnetic pollution.

Some of these television receivers had their immunity components left out at manufacture, as a cost-saving measure.

Standards are likely to be adopted to cover the level of immunity expected in all susceptible equipment.

All standards are drawn up by Standards Australia, which says it has published most of the technical standards needed for electro-magnetic interference.

Work is continuing on drawing up some of the required immunity standards, and the WIA is involved in this process.

(Thanks to Jim Linton VK3PC for supplying the information used in this item).

Book Review

Antennas and Techniques for Low-Band DXing

Written by John Devoldere ON4UN

Published by ARRL 1994

Paperback 400 pages 277 mm by 208 mm

Reviewed by Evan Jarman VK3ANI

This book is a revised version of "Low-Band DXing" by ON4UN published in 1987.

The lower frequency bands of the amateur service are constrained by factors that can be ignored elsewhere. The physical size of antennas and the propagation modes involved are more limiting than on the more popular bands. Refinements of theory have to be made in order to be realised in practice. This is where experience counts and this book is tempered with years of experience.

This is a reference book of ideas. While clearly aimed at the lower bands, it would benefit most amateurs. It is devoted to antenna design from theory through to construction. There are chapters on other subjects, but most (9 of 14) are on the antenna. One chapter is really a bibliography and another is a promotion of software packages.

The chapter on software is sparse. It is an overview of various software modules that the author makes available separately. The five pages of this chapter can be easily missed when reading through the book without loss of content. The software relates to the material in the book but is not mandatory.

Propagation is handled in the first chapter. It clearly is aimed at the lower frequency bands, being devoted to the propagation modes that affect these frequencies most. The D and E layers predominate. Other subjects such as grey line (along the sunset/sunrise great circle path), seasonal, aurora and non great circle paths are described in some detail and include maps, globes and tables. Subjects like chordal hop and

antipodal focusing make very interesting reading for those who thought that propagation is straight refraction of radio waves.

The chapter on equipment is not a set of construction projects. It is more concerned with the parameters that limit receiver and transmitter performance. While not described in detail, the reader soon becomes aware of the importance of things like noise, selectivity, stability, power and intermodulation distortion, as well as how to measure them.

It is in the chapters on antennas that this book is most valuable. They occupy over 80% of the book. There is an immense amount of material. Most antennas used on these bands are covered in considerable detail. Dipoles, verticals, loops, arrays, Yagis and quads have at least one chapter each. The author starts with radiation diagrams to enable best selection, then proceeds to convert theory into practice. Being devoted to the higher wavelength bands the problems associated with constructing these larger antennas get particular attention. Little things like wind loading become large problems and so are dealt with in detail, again from theory through to practice. The sizes of booms, crossarms and rotating equipment are dealt with to ensure that specifications are adequate. "Note the very limited amount of element sag, which is proof of good element design" shows what the author thinks of good mechanical design. Arrays are dealt with over a couple of chapters.

The chapters on vertical arrays,

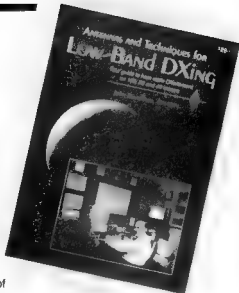
Yagis and quads are the largest in the book, clearly indicating the author's current work. The photographs in these chapters show the size of these antenna and the size of their supporting structures; some are truly awe inspiring sights.

The author deals with matching networks in detail. A wide variety of methods of matching feedline to antenna are discussed, proving that there is no such thing as a universal system. Some of these translate well to other bands. These alone make the book valuable.

The mathematics in the book are mainly basic algebra with some complex numbers and the occasional inverse trig function. The bibliography contains about 760 references to other books and magazines. It covers all the material in the book and provides a starting point for anyone who wants to delve further into a subject.

While devoted to the lower frequency bands, as a technical book on antenna design this publication is well worth looking at. I doubt if there is an amateur who wouldn't learn something from it.

This book is available for \$45.00 from some WIA Divisional Bookshops as well as from Daycom Communications Pty Ltd. The review copy was supplied by the ARRL



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TE 230 2 element mini beam	\$440
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TE 14 rotatable dipole	\$275
TE 34 3 element beam	\$695
TE 44 4 element beam	\$870
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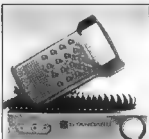


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Australian Packet Radio BBS Station Listing

Version 1.5 — July 1994

This listing has been compiled over approximately six months from the BBS operators all over Australia. The information should be useful as an address reference for the Australian network as well as giving some frequency information for those of us who occasionally operate portable packet around Australia. The information is as accurate as possible at the time of publication, however, no guarantees can be given. If you find an error in the listing or something missing, please send a packet message to VK5ZWI@VK5TTY.#ADL.# SA.AUS.QC with the updated details.

VK4DGO-1 @VK4DGO.QLD.AUS.OC
VK4UG-1 @VK4UG.QLD.AUS.OC
VK4XRG-1 @VK4XRG.BNE.QLD.AUS.OC
VK4ZGQ-1 @VK4ZGQ.BNE.QLD.AUS.OC
VK4WV-1 @VK4WV.BNE.QLD.AUS.OC

VK4CX-1 @VK4CX.BNE.QLD.AUS.OC
VK4WV-1 @VK4WV.QLD.AUS.OC

VK4 - Country

VK4ABP-1 @VK4ABP.#CWO.QLD.AUS.OC
VK4AFS-1 @VK4AFS.#HQ.QLD.AUS.OC

VK4AGF @VK4AGF.NWO.QLD.AUS.OC
VK4JL-1 @VK4JL.#CQ.QLD.AUS.OC
VK4AXA-1 @VK4AXA.#CQ.QLD.AUS.OC
VK4CAB-1 @VK4CAB.QLD.AUS.OC
VK4BPG-1 @VK4BPG.#CQ.QLD.AUS.OC

VK4DT-1 @VK4DT.GOLD.QLD.AUS.OC
VK4GRC @VK4GRC.#HER.QLD.AUS.OC

VK4GV-1 @VK4GV.FNQ.QLD.AUS.OC
VK4KEL-1 @VK4KEL.QLD.AUS.OC
VK4PY-1 @VK4PY.QLD.AUS.OC
VK4PS-1 @VK4PS.IFS.QLD.AUS.OC

VK4N-1 @VK4N.#CQ.QLD.AUS.OC
VK4U-1 @VK4U.#CQ.QLD.AUS.OC
VK4V-1 @VK4V.BSS.#MP.#ORG
VK4WR-1 @VK4WR.#CQ.QLD.AUS.OC
VK4BQ-1 @VK4BQ.QLD.AUS.OC
VK4TD-1 @VK4TD.#CQ.QLD.AUS.OC
VK4TEK-1 @VK4TEK.QLD.AUS.OC
VK4MS-1 @VK4MS.STPE.QLD.AUS.OC

VK5 - Adelaide

VK5LZ @VK5LZ.#ADL.#SA.AUS.OC

VK5TTY @VK5TTY.#ADL.#SA.AUS.OC

VK5W @VK5W.#ADL.#SA.AUS.OC

VK5BBS @VK5BBS.#ADL.#SA.AUS.OC

VK5OXX @VK5OXX.#ADL.#SA.AUS.OC
VK5ANC @VK5ANC.#ADL.#SA.AUS.OC

VK5SPG @VK5SPG.#ADL.#SA.AUS.OC

VK5 - Country

VK5SR @VK5SR.#MTG.#SA.AUS.OC
VK5SU @VK5SU.#MON.#SA.AUS.OC
VK5BRL @VK5BRL.#RV.#SA.AUS.OC

VK5PO @VK5PO.#BVL.#SA.AUS.OC
VK5HB @VK5HB.#LMR.#SA.AUS.OC

VK5RAC-1 @VK5RAC.#EYP.#SA.AUS.OC

Brisbane
Rochdale
Bray Park Bns.
Brisbane Cent.
Bray Park Bns.
17 Mile Rocks
Kedron Park QUT

Longreach
Townsville

Mount Isa
Mackay
Blackwater
Bundaberg, Qld
Santa

Gold Coast
Harvey Bay

Albion
Sunshine Coast
Harvey Bay
Warrara

Tien
Mount Morgan
Gladstone, Qld
Rockhampton
Gold Coast
Innes Park
Lawnton
Stanhope

Elizabeth
Adelaide North
O'Halloran Hill
Adelaide South

Thebarton
Adelaide Central

Moorbury
Adelaide NE

Adelaide
Adelaide

Adelaide SatGate

Mt Gambier
Pt Pirie
Riverland Bem

Barossa Valley
Lower Murray

Pt Lincoln

VK6 - Perth

VK6ANC @VK6ANC.#PER.#WA.AUS.OC
VK6BBS @VK6BBS.#PER.#WA.AUS.OC
VK6DPS @VK6DPS.#PER.#WA.AUS.OC
VK6YBP @VK6YBP.#PER.#WA.AUS.OC
VK6TTY @VK6TTY.#PER.#WA.AUS.OC
VK6ZSE @VK6ZSE.#PER.#WA.AUS.OC

VK6ZWH @VK6ZWH.#PER.#WA.AUS.OC

VK6 - Country

VK6RWR @VK6RWR.#KTA.#WA.AUS.OC
VK6AJ @VK6AJ.#BUN.#WA.AUS.OC
VK6RAW @VK6RAW.#KNG.#WA.AUS.OC
VK6SR @VK6SR.#ALH.#WA.AUS.OC



VK7BBS @VK7BBS.TAS.AUS.OC
VK7EKA @VK7EKA.TAS.AUS.OC
VK7GL @VK7GL.#HBT.TAS.AUS.OC

VK7YAK @VK7YAK.TAS.AUS.OC
VK7ZTA @VK7ZTA.TAS.AUS.OC
VK7AD @VK7AD.TAS.AUS.OC

VK8

VK8BBS @VK8BBS.#NT.AUS.OC
VK8DA @VK8DA.#DRW.#NT.AUS.OC

Carne
Roxeystone
Balga
Baga
Wireless Hill
Edgewater
Innahoo

Pt Sampson
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OFFICIAL WIA 1995 AUSTRALIAN RADIO AMATEUR CALL BOOK

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Australian Amateur Call Signs — History and Confusion

Colin MacKinnon VK2DYM* tells of the interesting background to VK callsigns

The current series of Australian call signs may seem a little baffling but looking back at the way in which our call signs have evolved shows that it has been much more confusing.

We know that there were wireless experimenters in most states of Australia from about 1897, very soon after Marconi's demonstrations in London. Engineers from the Post & Telegraph Dept, University researchers and a few individuals duplicated Marconi's wireless system in the period 1900-1904, with varying degrees of success. There were no call signs at that time, and operators simply used their station location or their names or initials as identifiers. Experimenters were supposed to obtain permission from the Royal Navy on Australian Station, ie before the formation of the Australian Navy, but most didn't bother and the Navy had no wireless to hear them anyway, although occasionally visiting Navy ships were equipped with wireless equipment.

By 1904 the Australian Navy did have several ships equipped with wireless and used the ship's names or initials as identification. For example the RNS "St. George" was just "SG". The Navy was keen to restrict wireless to military purposes only but wireless manufacturers saw Australia as a lucrative commercial market and demanded access. The Australian Government therefore enacted The Wireless Telegraphy Act of 1905 (October 1905) to place control of wireless under the PMG's Department. The WT Act did provide for private experimenters but because of the high fees (£3) and severe penalties (£500 fine or 5 years imprisonment for offences) very few licences were issued.

A Mr H G Robinson obtained what

was probably the first experimental licence issued, in November 1905 for "experiments in halls for lecture purposes", while the Marconi Co (NZ) obtained a licence in 1906 for trials of communication between Victoria and Tasmania. Also in 1906 E F G Jolley of Maryborough, Victoria, had stations in two houses about a mile apart. These licences all expired after 1 year. By 1908 the only experimental licence current in Australia was held by H W Jenvey who built two stations

early in 1908, one at St Kilda and another 65 miles away at Queenscliff, Victoria. In 1909 there were only two licences on issue, held by H Sutton at 290-292 Bourke St Melbourne, with apparatus capable of a 250 mile range, and C P Bartholomew at Mosman, NSW, with a range of 1/2 mile. In 1910 the Australasian Wireless Company was licensed with the call sign ATY, but this was changed to AAA when a new station was erected on the Hotel Australia in 1911.

The PMG Dept discouraged experimenters but, after representations by the newly formed Wireless Institute of Australia in April 1910, it adopted a more liberal attitude to licensing so that by August 1911 there was a total of 27 authorised "experimental" stations, 22 in Sydney, 3 in Melbourne, 1 in SA and 1 on King Island off Tasmania. (See Table 1).

TABLE 1

Experimental Licences current in August 1911.

(I do not have a complete list of call signs)

No.	Call	Name	Location
1	XBM C.P.	Bartholomew	Mosman, Sydney
2		H. Sutton	Malvern, Melbourne
3	XJQ	W.T. Appleton	Malvern, Melbourne
4a	XJP	J.H.A. Pike	Arncliffe, Sydney
4b		A.V. Robb	Arncliffe, Sydney
5	XEN	F. Leverrier	Waverley, Sydney
6		W.H. Hannam	Darling Point, Sydney
7	XPO	Rev A. Shaw	Randwick, Sydney
8	G.C.	Hamilton	Woolahra, Sydney
9		Royal Yacht Squadron	Sydney
10	XDM	MacLurcan & Lane	Hotel Wentworth, Sydney
11		E. Reeve	Rozelle, Sydney
12		A. Mearle	Kilkenny and Enfield, S.A.
13	XAA	J.Y. Nelson	PMG Dept. McMahon's Pt., Sydney
14		H. Leverrier	Gordon, Sydney
15	XCP	M.C. Perry	Randwick, Sydney
16	XAB	A.S. Arnold	Ashfield, Sydney
17		A.H. King	Marrickville, Sydney
18		F.H. Day	C. of E. Grammar School, Sydney
19		J.S. Dolan	Waverly, Sydney
20	XCA	R.C. Alsop	Randwick, Sydney
21		H.A. Stowe	Drumoyne, Sydney
22		A. Goodwin	Hamilton, Melbourne
23		C.N. Allen	Chatswood, Sydney
24		H.J.B. Foley	Randwick, Sydney
25	XPO	Rev. A. Shaw	King Island, Tasmania
		(Maritime Wireless Co of Australia)	
26	AAA	Australasian Wireless Ltd. Hotel Australia, Sydney — previously ATY Australasian Wireless Ltd Underwood St, Sydney.	

Beginning mid-1910 the PMG Dept issued the experimental stations with 2 letter call signs prefixed by "X" for experimental, with no distinction between states, or between private and commercial operators. For instance XAA was J Y Nelson (the Senior Electrical Engineer of the Sydney PMG Dept and also the local radio inspector), F Leverrier, a leading Sydney experimenter, was XEN, N S Gilmour, of St. Kilda, was XNG, Father A Shaw of the Maritime Wireless Co had XPO and so on. By the way, the experimental licence consisted of 6 foolscap pages of regulations and restrictions.

When the government wireless stations at Sydney and Applecross (WA) commenced operations in 1912 they were allocated POS, for Post Office Sydney, and POP for Perth, but following an international wireless convention which allocated prefixes on a world wide basis the PO was changed to a VI, hence VIS and VIP.

In August 1912, as more and more people showed interest in experimental operation and applied for licences, the PMG's Dept decided it should identify each state by changing the call sign sequence as follows:-

NSW XAA — XIZ
VIC XJA — XPZ
QLD XQA — XUZ
SA XVA — XXZ
WA XYA — XYZ
TAS XZA — XZZ

This meant that several call signs had to be altered to comply with the new series. For example in NSW, J H Pike who had been XJP received a new call of XDY, and C S Crouch XRT, became XCC. This change explains the discrepancy in early lists showing different call signs for the same person

When the initial series was filled an extra letter was added. In NSW, for instance, the block of 2 letters AA to IZ allowed for 234 licences, and when they were used up the series was continued as XAAA — XIZZ. At the time an experimental licence cost £1/1/-.

This call identification became a little cumbersome so in July/August 1914 the calls were altered to X with a number to identify the state, then 2 letters, eg the PMG Radio Inspector's

call in NSW became X2AA. Not many licensees had the chance to use the new calls before World War 1 was declared and all wireless experiments ceased in August 1914. In November 1915 the Navy again took control of all wireless, including the commercial and government stations.

Note that licences and call signs were issued for receiving purposes too, and in fact very few experimenters actually had transmitting equipment.

The experimental licence consisted of 6 foolscap pages of regulations and restrictions

After WW1 the Navy still controlled the airwaves and was reluctant to allow wireless experiments but following extended negotiations between the WIA and the Navy, Radio Commander Creswell agreed in June 1919 to issue Temporary Permits to experiment in Wireless Telegraphy. These were for receiving only but permits to transmit and receive were issued to the WIA, a couple of Universities and one or two prominent

experimenters. At this time the Naval Director of Radio Services instigated a new call sign system consisting simply of the sequential licence number, prefixed by the state initial. For instance R H Davies of Melbourne obtained licence number 237 so his call sign was V237 whilst the next applicant, A B Cummings in Queensland was call sign Q.238. By February 1920 more than 600 permits had been issued. In April 1920 the Government took charge and re-introduced regulations allowing experimental and instructional licences. An experimental licence cost £2/1/-.

In September 1920, the Government amended the Wireless Telegraphy regulations to remove all wartime restrictions and placed the control of wireless under the "Director of Radio Telegraphy, Prime Minister's Department, Melbourne". When the new Director took over from the Navy in early 1921 he changed back to the pre-war call system of X2AA etc. Some "transmitters", as they were called, requested specific call signs, so for example one leading transmitter, Charles D MacLurcan, obtained X2CM.

TO RADIO VK2JJP... UR JNA.Q.C. SIGS VK2JJP... HERE ON 14.10.29
 AT 12.29 P.M. S.M.T. ... CALLING RADIO ...
 ON 12.29 P.M. ...
 QRN ...
 RECEIVED ...
 Circuit ...
 Amplification ...
 Remarks ...
 AERIAL ...
 COUNTERPOISE ...
 QRE? ...
 PSE QSL Always glad to QSR. Best 73's
 J. H. A. PIKE, Rawson Street, Epping, Sydney.
 14 Samson Rd. Epping, N.S.W.

This QSL dated 14 October 1929, originally printed as X2JP has been altered to VK2JJP. It belonged to J H A Pike mentioned in the text as holder of callsign XJP (later XDY) before WW1. The first QSL cards probably were sent in the early 1920s. They had no prefix at all in the callsign, but usually just the initials of the station operator. Later a system was used internationally by which a prefix was used whose letter served to indicate the country of origin. For example, Australia took the letter A, Canada C, USA U, Japan J, and so on. (Card from the WIA QSL Collection)

Other less prominent experimenters who wished to transmit were discouraged till 3rd November 1922, when further new regulations were released, allowing experimental wireless in 2 categories:-

- a) transmit and receive and
- b) receive only.

The receive only licence was further split into:

- i) crystal receiver and
- ii) valve receiver.

The cost of a licence became £1/- for the full licence and 10/- for the receive only licence

If a licensee had a valve receiver he had to be able to read Morse code at 12 WPM, the reasoning being that if the valve broke into oscillation (as was likely with the unstable circuits or regeneration used) and was interfering with one of the navy or commercial stations, which were still using Morse, they could come back and tell the offender(s) to close down.

The PMG's Dept took over the control and licensing functions from the Prime Minister's Dept at this time, and the call signs were altered yet again, to XA2AA, XA3AA, etc where "X" was for experimental and the "A" identified Australia on an international prefix system.

Up to this time there were only about 60 genuine amateur transmitters in all Australia. The other approx 650 licensees were in fact "listeners", ie they had receivers only and most had little technical interest

or expertise, BUT they did have valid call signs.

The Experimental Licence that was issued during this period was endorsed with either:

- T — to signify approval to Transmit and Receive
- R — to indicate Receive only and then
- C — crystal or
- V — valve

The regulations also provided for a Broadcast licence which allowed an experimenter to transmit news and entertainment, but no advertising or payment was permitted. Other restrictions were the same as for the experimental Transmit licence. As it cost £5, few experimenters took up this licence but some did go on to become prominent broadcasters.

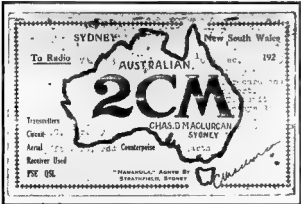
There were only about 60 genuine amateur transmitters in all Australia.

Although the regulations did not come into effect officially till 1-12-1922, experimental licences were issued from October 1922 with both transmitters and listeners receiving call signs. By mid-1923 around 700 call signs had been issued and NSW had used up all its 2 letter allocation and was about to issue 3 letter calls. However, in May 1923 the PMG decided to hold all further

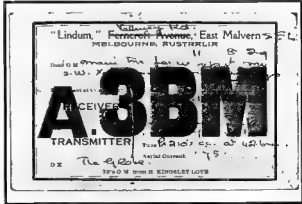
applications pending the release of new regulations which would include commercial broadcasting. There was growing public and industry agitation for broadcasting, so a conference of all interested parties was held in May 1923 to organise and regulate public broadcast operations.

The 1923 Broadcast Conference included representatives from all groups interested in wireless who framed regulations to introduce and control public broadcasting. The conference was dominated by Mr E T Fisk of AWA, who pushed through his proposal for the infamous "Sealed Set" system, whereby listeners could use a receiver tuned and sealed to receive one station only for a fee of up to £4/4/- per year, with additional costs if one wanted to listen to another station. Experimenters lost some privileges to commercial interests and were misled by certain delegates. The new regulations were delayed so the PMG started to issue experimental licences once again, but this time only genuine transmitters received a call sign also.

When the new broadcast regulations finally became effective in August 1923 a new class of licence was issued, a "Broadcast Listener's Licence", costing 10/-. However, it was obvious that obtaining a receive only experimental licence for 20/-, with no restrictions on tuning, was cheaper than the broadcast listener's licence plus the station fee of £2/2/- to



An Early QSL of Chas MacLurcan, dated 10 December 1925. Chas was one of the first experimenters to be granted a licence after WW1. He broadcast music over the Sydney area in 1921-2 on 1400 m before commercial broadcasting began. (Card from the WIA QSL Collection).



A QSL dated 11 August 1929 from Howard Kingsley Love, founder of Kingsley Radio and first Federal President of the WIA. Some operators did not change their call sign to AO after February 1927, but retained the A prefix. (Card from the WIA QSL Collection).

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Other new features include naming of memory channels, DTMF Auto-dial memories, and DTMF Message Paging with up to 6 alpha-numeric characters. A large range of accessory lines are also available for easier customisation of your transceiver.

The FT-11R comes with an FNB-31 600mA/H NiCad, belt-clip, approved AC charger, CA-9 charge adaptor and antenna.

Cat D-3640

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Unlike some competing models, small size doesn't mean small facilities. The FT-840 provides easily-accessible features such as: Variable mic gain and RF power controls, SSB Speech processor for greater audio punch and IF Shift plus CW Reverse to fight interference. Dual Direct Digital Synthesizers ensure clean transmitter output and fast Tx/Rx switching, while the low-noise receiver front end uses an active double-balanced mixer and selectable attenuator for improved strong signal handling. The FT-840 weighs just 4.5kg and uses a thermally-switched cooling fan, surface-mount components and a metal case for cool, reliable operation. An extensive range of accessory lines are available, including the FC-10 external automatic antenna tuner, so you can customise the FT-840 to suit your operating requirements.

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Cat D-3635

FT-5200 2m/70cm Mobile Transceiver

The FT-5200 uses the latest innovations in compact cross-band full-duplex and detachable front-panel design for brilliant mobile performance. It has 32 tuneable memories, a built-in antenna duplexer, dual full-frequency LCD screen (with signal strength/power output bargraphs for each band), 8-level automatic display/button lighting dimmer and dual external speaker jacks (one for each band). A thermally-activated fan allows up to 50 watts output on the 2-meter band and 35 on the 70cm band. Plus, scanning features include programmable scan limits, selectable scan resume modes, memory skip, priority monitoring and one-touch recall CALL channels. In addition, 6 user selectable channel steps are provided and a FRG-4 DTMF paging select option lets you program a three-digit ID code so you can be paged by other transceivers, or page up to 5 other stations yourself. An optional YSK-1 remote panel lets you relocate the main rig (under the front seat, for example) and mount the control panel on the dash. The FT-5200 comes with hand-mic, mobile mounting bracket and DC power lead.

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The rugged 5BTV is a 5-band HF trap vertical which continues the Hustler tradition of quality and performance. It incorporates Hustler's exclusive trap design (25mm solid fiberglass formers, high tolerance trap covers and low loss windings) for accurate trap resonance with 1 kW (PEP) power handling. Wideband coverage is provided on the 10, 15, 20 and 40m bands (SWR typically 1.15:1 at resonance, < 2.1 SWR at band edges) with 80kHz bandwidth typical on 80m at less than 2:1 SWR. An optional 30m resonator kit can also be installed without affecting operation of the other bands. High strength aluminium and a 4mm (wall thickness) extra heavy-duty base section guarantee optimum mechanical stability. At just 7.65m, the 5BTV can be ground mounted (with or without radials: although radials are recommended), or it can be mounted in an elevated position with a radial system. Unlike other antenna designs, the 5BTV can be fed with any length of 50-ohm coax cable.

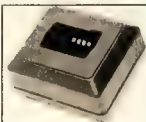
Cat D-4920



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£4/4/-, and so somewhere around 1000 "listeners" applied for experimenter's licences. The broadcast stations soon complained that they were not receiving their expected fees so the PMG sent out letters to people who had experimental receive only licences, cancelling those licences and call signs and telling them to apply for a broadcast listener's licence. Many licences were cancelled, but someone objected in early 1924 and the government found that as the licence was validly issued, it could not be cancelled, even though the licensee was not in all fairness a wireless "experimenter".

To solve that problem, as each licence came up for renewal the licensee had to demonstrate that he was in fact competent to experiment and not just a listener. Previously, any exam or Morse test was at the discretion of the radio inspector and it appears very few applicants had to prove they knew anything about wireless. With the new approach, the number of experimental licences in the period 1924-1925 dropped significantly from the 1923 level and many names and call signs vanished. It was estimated in early 1925 that there were about 1200 experimental licensees in Australia, of which less than 90 were transmitters and the rest, even though they held call signs, should have been reclassified as Broadcast Listeners. Deleting all these listeners from the call sign lists left many gaps in the sequence up till the mid-40s when growth in numbers finally made the 3 letter call sequence necessary.

This practice of issuing call signs to listeners with no real technical expertise raises a problem concerning claims by some old timers to precedence in amateur activities. For instance Miss F Violet Wallace (later Mrs. McKenzie), is regarded as the first Australian female amateur, but the records show that there were four ladies, all listeners but with valid call signs, before Miss Wallace obtained her licence.

During the 1922-25 period experimenters were blamed for interference with other stations, and the Wireless Institute was keen to make a distinction between true

"experimenters" who were engaged in research and wireless construction, and those who they called "amateurs", who were only listeners, using store bought or simple kit-built crystal or 1 valve sets. The amateurs were to blame for interference with broadcasts, but of course experimenters were more proficient!

The Fisk "sealed set" scheme mentioned above was a failure and less than 12 months later another Broadcast Conference convened and new regulations closer to the present broadcast rules were issued by the PMG in July 1924. At this second conference the experimenters came under further pressure and lost more band space and privileges. One recommendation of the conference was to revoke all experimental licences and instead issue no more than 980 "Expert Experimental Licences" (Australia wide) to genuine experimenters, to be approved by the WIA. The allocation per state was to be:

NSW	— 300
Vic	— 300
SA	— 100
WA	— 100
Qld	— 150
Tas	— 30

Fortunately the PMG rejected this proposal, and when it issued new Statutory Regulations in July 1924 it clarified the Experimental Licence and Broadcast Listeners Licence and at this time introduced formal examinations for the Amateur Operators Certificate of Proficiency (AOCP). The morse requirement was 12 WPM and the exam cost 5/- whilst issue of a certificate cost another 2/6.

A further change in the call sign identifier occurred in 1927 when another international radio conference decreed that Australia should use the prefix OA effective from 1-2-1927, so we then had calls such as OA3BM, Howard Kingsley Love. "O" was for Oceania and "A" for Australia.

Only a couple of years later yet another international agreement saw the calls changed to the current VK plus a number prefix, for instance VK2JP (J H Pike again). That change came into force at midnight of 31-12-1928, but the PMG Chief Radio Inspector, Mr Jim Malone, decided

that VK call signs would be used from 8-12-1928 so that the change would be fully implemented by 1-1-1929, which explains why some contacts and QSL cards seem to have jumped the gun by quoting "VK" calls prior to January 1929.

There does not seem to be any official declaration of the call sign format so many experimenters used their own interpretation by adding a hyphen or a full stop to their call signs as printed on QSL cards, such as XA-4CD, OA2-BH, VK.2AK and VK-4SU. There was even VK3DL and VK3--H-W. Some, perhaps speculating on further changes, abbreviated their QSL cards to show just the number and letters, such as 4WK and 5BJ. Magazines of the era often left the prefix off the calls when reporting experiments' activities anyway.

Finally, the PMG recognised a changing understanding of the terminology and "Experimental Station Licensees" officially became "Amateur Station Licensees" from 19-9-1947.

After all that, I think I'll let some future historian work out the significance of the more recent variations in VK0, VK9, Z, C, K, M and N calls, because now I'm confused!

References:

Australian Archives.
Mitchell Library.
Amateur Radio magazine.
Documents in collection of
C MacKinnon

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BT



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ALARA

Judy Atkins VK3AGC

VK5 NEWS

A very pleasant morning coffee meeting was enjoyed by a group of VK5 girls when they met up with Jenny VK3MDR, OM Phillip VK3JN1, and the two harmonies Barry and Kate when they were passing through Adelaide. Christine VK5CTY, Denise VK5YL, Paddy VK5ZYB and Joy VK5YJ shared a lovely morning tea break at the outdoor tables on the North Terrace in the pleasant sunshine before they went off to see the sights of the city.

Jenny had managed to catch up with Mary VK5AMD as she passed through Bordertown the previous day. She will try to contact as many YLs as she can on her travels. The family is tenting it out as far as the Strezlecki Track. It will be quite a trip by the time they return home.

We all enjoy the opportunity to meet face to face, so make sure people know **YOU** are there as you go on your travels.

Across Australia with Amateur Radio

On 5 May OM Ron VK3BYM and myself, Judy VK3AGC, received the good news that Christopher Paul, grandson number two, had arrived at Kalgoorlie Hospital (a little early but quite OK). With daughter Jennifer for company, I left Taradale at 6.30 am on Tuesday, 24 May for the long trip. We went via Mildura where we had lunch and a welcome break with Marilyn VK3DMS before continuing on. We arrived in Port Augusta at 8.45 pm.

Next day we set sail for Border Village. Before long we struck trouble in the form of gale force winds, rain and the worst dust storms I have ever seen. Visibility was down to two white lines ahead. The weather was playing havoc with the "185" Travellers Net but I managed to get a relay via Brunel, courtesy of Barbara V85BJ, to let Net Control know we were OK. Thursday morning, after a quick stopover at the old Telegraph Station at Eucla, we were on our way. The dust was gone and we had an interesting drive seeing kangaroos, emus, feral tabby cats and lots of beautiful golden eagles. Knowing that the price of petrol across The Big Paddock (Nullarbor Plain) was very expensive (23 cents per litre dearer than at home), I carried three jerrycans and soon learnt how to siphon petrol with a piece of hose. We arrived at Kambalda late in the afternoon after travelling 2,965 km in three days. It was great to see Paul, Martine, Steven and little Christopher.

Friday, 3 June we rode camels at Coolgardie then enjoyed a two hour tour of Long Shaft which is the largest Nickel Mine in Kambalda. We went underground to a depth of 822 metres, then hitched a ride in a passing four wheel drive. What a ride! The next day we drove to Fremantle and stayed with Margaret and Mark VK6AR. That evening at the Casino we won \$250 (petrol money!).

I found it quite embarrassing using 20 m mobile because the windscreen wipers started working each time I transmitted, causing some strange looks as the weather was hot and dry. On the VK6 Sunday morning WIA broadcast it was announced that Poppy VK6YF had organised a luncheon for Monday Mark, Margaret, Jennifer and I had a lovely day at Underwater World and watched the Dolphins being fed. Jennifer had to be back at work on Monday, so it was off to the airport late that evening as she was booked on the "red-eyes" flight back home.

The luncheon was very enjoyable and made it possible for me to meet a lot of friends I would not have been able to catch up with otherwise, including Poppy VK6YF and Les VK6EB, Cliff VK6LZ and Christine VK6ZLZ, Rob VK6RB and Joy, Brian VK6NKB and Suzanne, Mark VK6AR and Margaret and Syd (5/9) VK6SMH.

On Tuesday, 7 June I said goodbye to Mark and Margaret and headed back to Kambalda to spend some more time with the family. Saturday, 11 June I started my lonely trip back home stopping at Mundrabilla that night I headed off early next morning and came across a beautiful golden eagle perched in a dead tree beside the road. It let me walk within 10 ft of it before it flew away. Again I visited the Telegraph Station at Eucla. This has become a ritual for me on every trip (12 crossings so far) because the shifting sand dunes mean that sometimes I see a lot of the old building and sometimes only the chimney is visible.

On the way to my next stopover I had good contacts on 20 m with Ron, Graham, Larry, John, and Bev, as well as Masa JA1IOZ who came in very useful as a relay when VK conditions dropped out. I left Wudinna the next morning headed for Adelaide and a home cooked meal with Bob VK5MM, where I used Bob's rig to join in on the ALARA net. After spending the night with Christine VK5CTY and Geoffrey I had lunch with Christine, Jenny VK5ANW and Denise VK5YL. I left Adelaide mid afternoon for Murray Bridge and the company of Meg VK5AOV and David at their lovely home overlooking the Murray River. Wednesday, 15 June I left Meg's QTH for the last leg of my trip. At Bordertown I had coffee with Mary VK5AMD, then headed off again, arriving home at 5.30 pm, tired but still in one piece after 7,895 km.

Many thanks to all who kept me company on my trip, especially to the operators of the "185" net. ar



Amateur radio, particularly the Travellers Net, is fantastic company and security when you travel alone in country like this, the Eyre Highway across the Nullarbor Plain.

AMSAT Australia

Bili Magnusson VK3JT*

National co-ordinator

Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI

AMSAT Australia net:

Control station VK5AGR

Bulletin normally commences at 1000 UTC, or 0900 UTC on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies (again depending on propagation conditions):

Primary 7.064 MHz. (usually during summer).

Secondary 3.685 MHz. (usually during winter).

Frequencies +/- 5 kHz for QRM.

AMSAT Australia newsletter and software service

The newsletter is published monthly by Graham VK5AGR. Subscription is \$30 for Australia, \$35 for New Zealand and \$40 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide SA 5001

New Satellite Tracking Software

The June '94 edition of the AMSAT Journal from AMSAT-NA contained a review of a new MicroSoft Windows based satellite tracking program called WinSat Ver 1.0. I have not had an opportunity to actually look at it so the following is merely my reaction to the review.

The software offers the usual Windows main screen with pull down menus and various screens which can be "tiled". The sizes of the screen images can be increased to full screen or reduced to icons. A typical operating situation would see a multi-coloured map reminiscent of InstantTrack as the main screen element, a smaller "3D" map similar to IT's polar projection map, and a very detailed tracking data block, all on screen together. Windows devotees will be familiar with the ability to increase or decrease or overlap images at will.

Max mixing the main map results in an image remarkably like IT. One of IT's attributes is that it will work satisfactorily, albeit slowly, on an XT WinSat, however, will require at least a 386 based machine with a math co-processor. It appears that the current version 1.0 has a few shortcomings and several new features are already being advertised as being "in

the pipe line". The next version will offer support for the Kansas City Tracker and the AEA ST-1 tracker. It will also include features like mutual visibility predictions and ephemeris for any ground station and satellite combination.

WinSat is available from AMSAT-NA. Price is \$US30 for members and \$US50 for non-members. Upgrades will be made available to registered users of version 1.0 at substantial discounts.

Home Brewers, Ahoy!

This point came to light during correspondence with Bob VK3BNC. Bob, an avid home brewer, had contacted me to see if I could put him in touch with any other satellite operators who were similarly involved in constructing their own satellite ground station equipment. One or two came to mind but it was by no means a wide field so I thought I'd mention it in this column. Maybe we could drum up some mutual support for people finding themselves in Bob's situation.

He wanted to bounce a few ideas around, discuss circuit options, parts availability, etc. Maybe you, too, have wanted to contact home builders in the satellite field. Perhaps we could use this column to publish a list of those who are keenly interested in home building satellite related gear.

Have you built much of your own gear? What are your special areas of interest? How do you feel about such a list? Drop me a line or maybe a packet to VK3JT@VK3BBS.#MEL VIC.AUS.OC Bob is quite happy to have other home-brewers contact him direct.

Moon Bounce Tests from VE3ONT

It's on again. The weekends of 29/30 October 1994 and 26/27 November 1994 will give satellite operators an excellent chance to test the effectiveness of their receiving equipment. Once again it's time for the ARRL moon bounce (EME) contest weekends. As happened last year, the Toronto VHF Society VE3ONT have negotiated use of the 150 foot diameter radio astronomy dish at the Institute for Space and Terrestrial Sciences, Algonquin. They will not be active as contesters, of course (that'd be a bit unfair, hi!), but the massive gain of this dish will allow moon bounce contacts with VHF/UHF operators who would not normally consider their station to be in the EME class.

Many VHF/UHF DXers will find it possible to hear and maybe even work VE3ONT Satellite operators with az/el pointing antennas, of sufficient gain to do well on the OSCARs, will have the opportunity to assess the performance of their station, in particular their receiving equipment.

You can use a tracking program like InstantTrack to predict the moon's position and plan your listening watch. Standard amateur tracking programs like IT are not accurate enough for serious EME work but it's unlikely your antenna will have a main lobe of less than 3 degrees, so these programs are quite adequate for this purpose. It's quite a challenge and well worth the effort.

Last year Ray VK3PYP and I sat up until the wee small hours with mixed results. But the excitement of hearing those signals from the moon will see us doing the same this year. The mutual window between eastern Australia and Algonquin is only a few degrees and last year the time was very limited.

Next month I'll run some figures for eastern OZ and give a list of bands, frequencies, times and operating protocols (rules). Resolve now to take part in this test. I think you'll find it quite exciting and a great chance to critically assess your satellite station. "If ya can't hear 'em, ya can't work 'em".

P3D Transponder Matrix

A couple of months ago I covered the various transponder modes that are operating on the current generation of amateur radio satellites. At that time I said I would look next at the arrangements planned for the Phase 3D satellite at present being built for a projected launch in 1996.

There has been much discussion regarding choice of bands and frequencies with many users pushing for the retention of what is currently known as "mode B". As planning proceeds it becomes more apparent that the only way to go is UP. The 2 metre band down link of mode B and, for that matter, the 2 metre band up link of mode J, are experiencing more and more difficulty with QRM and, in some countries, are already unusable. The designers are being forced to consider microwaves as a necessary feature rather than an alternative for the experimentally minded amateurs.

A builder stepped forward virtually at the last minute for the 2 metre transmitter so it looks like mode B will fly on P3D. The traditional approach of switching between hard wired transponders will be replaced with a much more flexible arrangement called a matrix. This will enable the mating of any receiver with virtually any

transmitter to give a wide variety of "transponders" with the possibility of some combinations running concurrently.

The matrix will be fed by receivers on 2 metres, 70 cm, 23 cm, 13 cm and 6 cm (5.6 GHz). The matrix will send its output to transmitters on 2 metres, 70 cm, 13 cm, 3 cm (10.45 GHz) and 1.3 cm (24 GHz). Antenna switching will also be part of the matrix.

One of the main reasons for the move into the microwave region is space for antennas and achievable antenna gain. At an apogee of about 50,000 km the earth subtends about 13 degrees and this corresponds to a maximum useable gain of about 20 dBi. More gain than this will

result in the signal not covering the entire earth surface at apogee and less gain will result in wasted power as much of the signal is sprayed into space. It is not possible to achieve the optimum gain on the lower frequencies, even on what will be a very large amateur radio satellite. So all that adds up to this....If we want all the goodies associated with a satellite like P3D, we had better get used to the idea that the most efficient modes will probably employ 1.2, 2.4 and possibly 5.6 GHz up links and 2.4, 10.4 and 24 GHz down links.

The large variety of modes that the matrix makes available will necessitate a new method of mode designation. The "transponders" will exist only in the mind

of the matrix. The various combinations will be known by their up link and down link band designations. The first letter will name the receiver on the satellite while the second letter will name the transmitter.

Thus mode SX will uplink on S band (2.4 GHz) and downlink on X band (10.4 GHz). Having said all that, the old modes B and J will no doubt have their place on P3D. Perhaps newcomers will be getting their feet wet on those modes rather than mode A as many of us did. Ah well, that's progress.

*359 Williamstown Rd Yerraville VIC 3073
Packer VK3JT/VKGBBS

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AWARDS

John Kelleher VK3DP — Federal Awards Manager*

Comment on the use of the Hamlog program in its present form, ie alphabetical listing by countries, and the ever present difficulty in transcribing your DXCC entries to master files, has borne fruit. During the past month or so I have been contacted by VK7TS and VK2NO, who both have assured me that they now have the capability of producing DXCC listings in alphabetical listings of call signs which, I suggest, is the way to go.

This latter method falls into line with the ARRL method, which is the method that has been adopted by all WIA Awards Managers. I sincerely thank these gentlemen and feel that a few words with either gentleman may help others immensely. Here, I must also enter a plea to the Award managers of radio clubs and amateur organisations who sponsor awards. I am offering free publicity through this column to any organisation which supplies me with any information that will help amateur activity in general. I would like to publish a few Australian Awards, in preference to some that have already been mentioned in this column.

The RSGB HF Awards Manager, Fred Hanscombe G4BWP, has asked me to publish details of the RSGB HF Awards program, which was received at this office within the last month.

RSGB HF Awards

General Rules

The following general rules and conditions apply to HF certificates and awards issued by the *Radio Society of Great Britain* and should be read in conjunction with the conditions which govern the particular award program. Claimants may be either licensed radio amateurs or short wave listeners. All

certificates, but not plaques, are available on a "heard" basis to listeners.

Claim eligibility

All claims must be submitted in a form according to the Awards Manager. Where application forms are provided for particular award programs, these should be used, although a computer generated form including the same headings will generally be accepted. Each claim must include the following signed declaration: *"I DECLARE THAT all the contacts were made by me personally from the same DXCC country and in accordance with the terms of my radio transmitting licence, and that none of the QSLs have been amended in any way since receipt. I accept that a breach of these rules may result in disqualification from the award program. I further accept that the decision of the HF committee shall be final in all cases of dispute."*

DX claims must be accompanied by QSL cards, but only in the case of those categories which attract a plaque. Generally, a statement from the applicant's national society that the necessary cards have been checked will be accepted, except that the HF Awards manager reserves the right to ask to see some, or all, of the cards. Each claim must be accompanied by a fee of \$US6.00 or 9 IRCs per certificate, or class of certificate.

Contact Eligibility

All contacts must be made by the holder of the call sign. Contacts may be made from any location in the SAME DXCC COUNTRY. Except where otherwise indicated, credit will be given for contacts made on or after 15 November 1945 on any of the nine

amateur bands below 30 MHz. Contacts with land mobile stations will be accepted, provided the location at the time of contact is clearly stated on the QSL card. Credit will be given for two-way contacts on the same mode and band (ie not cross-mode or cross-band). Certificate endorsements for single mode transmission and/or single band may be made on the submission of cards clearly confirming the mode or frequency of transmission, but the request must be made at the time of application.

The submission for credit of any altered or forged confirmations, or equally, bad behaviour on or off the air which is judged by the HF Committee to bring a particular program into disrepute, may result in disqualification of the applicant from ALL RSGB award programs. The decision of the HF Committee on this and other matters of dispute will be final.

Applications for all Awards should be sent to F C Handscombe G4BWP, "Sandholm" Heath Farm Road, Red Lodge, Bury St Edmunds, Suffolk IP28 8LG, England.

Islands on the Air (IOTA)

The IOTA program was created by the late Geoff Watts, a leading British short-wave listener, in the mid-1960s. When it was taken over by the RSGB in 1985 it had already become, for some, a favourite award. Its popularity grows each year, and it is highly regarded among amateurs world-wide.

The IOTA program consists of 18 separate awards which may be claimed by any licensed amateur (also available to SWLs on a heard basis) who has had contact with stations located on islands. Many of the islands are DXCC countries in their own right: others are not but, by

meeting particular eligibility criteria, also count for credit. Currently there are some 800 islands listed with IOTA reference numbers.

The basic award is for working stations located on 100 islands/groups. There are higher achievement awards for working 200, 300, 400, 500, 600, and 700 islands/groups. In addition, there are seven continental awards (including Antarctica), and three regional awards (Arctic Islands, British Islands and West Indies) for contacting a specified number of islands/groups listed in each area.

The IOTA Worldwide Diploma is for working a set number of islands in each of the seven continents. A Plaque of Excellence is available for confirmed contacts with at least 750 island/groups. The rules require that, in order for credit to be given, QSL cards need to be submitted to nominated IOTA checkpoints for checking. A feature of the IOTA program is the Annual Honour Roll, appearing in *Radio Communication* magazine (May or June issue) and in the *RSGB's DX News Sheet*, which encourages continual updating of scores.

If "island chasing" appeals to you (and it can become compulsive) then write for the IOTA directory which gives full information on the awards. It is available for \$US12.00 or 18 IRCs from RSGB IOTA Director Roger Ballister G3KMA, La Quinta, Mimbbridge, Chobham, Woking Surrey GU24 8AR, England.

Worked ITU Zones (WITUZ)

This award may be claimed by any licensed radio amateur who is eligible under the general rules and who can produce evidence of having contacted, since 15 November 1945, land based amateur radio stations in at least 70 of the 75 broadcasting zones, as defined by the International Telecommunications Union (ITU).

The certificate holder may claim, on payment of a contributory charge, a handsome plaque with a plate detailing name, callsign, date, and number of the award. Additionally, an amateur providing evidence of having contacted all 75 ITU zones may claim the Supreme Plaque in recognition of the magnitude of the achievement, again on payment of a small contributory charge. **NB:** There is also a 5 Band Worked ITU Zones (5BWITUZ) for which award special rules apply.

Commonwealth Century Club (CCC)

This award may be claimed by any licensed amateur who can produce evidence of having contacted, since 15 November 1945, amateur radio stations in at least 100 Commonwealth call areas on the list current at the time of application.

The certificate holder may claim, on payment of a contributory charge, a handsome plaque with a plate detailing name, callsign, date, and number of the award. Additionally, an amateur providing evidence of having contacted all the Commonwealth call areas on the list current at the time of the application may claim the Supreme Plaque in recognition of the magnitude of the achievement, again on payment of a contributory charge. **Note:** Credit for South Georgia and the South Sandwich Islands will only be given for contacts with stations using a VP8 callsign. Credit for Antarctica and the South Orkney and South Shetlands islands will only be given for contacts with stations using a callsign issued by a Commonwealth government. There is also a 5 Band CCC, to which special rules apply.

28 MHz Counties Award

This award may be claimed by any licensed amateur who can produce evidence of having contacted, since 1 April 1983, amateur stations in 40 counties/regions in the United Kingdom Channel Islands and Isle of Man on the

28 MHz band. Stickers are available for 60, and all 77 counties/regions.

To qualify, submit a list of counties/regions in strictly alphabetical order with the callsign, and date of the contact.

DX Listeners' Century Award (DXLCA)

This award may be claimed by any short wave listener who can produce evidence of having heard amateur radio stations in at least 100 DXCC countries. Stickers are available for every 25 additional countries confirmed.

Submit a list in radio prefix order with the callsign and country name. Endorsements are also available for hearing 100 countries on 5, 6, 7, 8, and 9 bands (they need not be the same countries on each band).

Copies of the full RSGB HF Awards Program and relevant application forms and countries lists are available from this office on receipt of a long SAE and two IRCs.

'PO Box 2175 Caulfield Junction 3181

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Club Corner

QARC Wins VHF Field Day Contest (Again)

The Geelong Amateur Radio Club station VK3ATL participated again this year in the VHF field weekend contest winning the portable multi-operator section for the 5th time since the inception of the contest in 1989. Operators were VK3s TU, PK, BCL, DQW, AJF and BRZ.

The club operated from Blue Mountain (850 m ASL) near Trentham in Victoria, grid square QF22. Bands in use were 6 m, 2 m, 70 cm and 23 cm, all SSB. Contacts were made into VK1, 2, 3, 5 and 7 on both 2 m and 70 cm, with 6 m adding some VK4 and ZL grids as well. Additional valuable points were gained from a surprising number of contacts on 23 cm, including those to VK3XRS at Bairnsdale and VK7XR at Devonport, both well over 300 km away.

Other significant contacts were VK2ZAB on both 2 m and 70 cm, and VK2FLR on 2 m via aircraft reflection. Both stations are in Sydney. VK1s DO, TRT and CO on hilltops around Canberra were workable at will on 6 m, 2 m and 70 cm. An attempt with VK1DO on 23 cm nearly resulted in a contact, the two stations hearing each other but failing to exchange reports.

As reported in April *Amateur Radio* the total score exceeded 33,000 points, which was the club's best ever result, in part attributable to the inclusion of 23 cm in its artillery. Needless to say, the club will be defending its position as Australia's top VHF multi-op contest station next year.

Chas Gnaccarini VK3BRZ

66 Smeaton Close, Lara, VIC 3212

Radio Amateurs Old Timers Club of SA

The Annual Luncheon will be held on Tuesday, 25 October 1994 at 12 noon at the Marion Hotel, Marion Road, Mitchell Park.

We invite amateurs, 60 years of age and over, who have held or are eligible to hold an amateur radio licence for 10 years or over, to join us again.

Committee members are:
President John Allan VK5UL Tel 344 7465
Secretary Ray Deane VK5RK Tel 271 5401
Jack Townsend VK5HT Tel 295 2209
Lew Schaumloffel VK5AKQ Tel 263 0882
RSVP by 21 October 1994 to any of the above. Ladies are welcome.

Public Transport — TransAdelaide Bus 243 to Stop 24

Ray K Deane VK5RK

Secretary

35 Truro Ave, Kingswood SA 5062

Shepparton 1994 Communications Day

The Shepparton and District Amateur Radio Club will hold its popular Communications Day on Sunday, 18 September this year. The venue first used for the 1993 event will be used again. It allows the commercial traders, specialist groups and those wishing to dispose of preloved equipment plenty of room to spread out.

The display of vintage radio equipment proved popular in 1993 and this group will be back again with more wireless sets from the past to be admired. Major traders have again indicated that they will be attending with a number of new models about to be released on to the Australian market. Several short lectures will allow those present to gain an insight into aspects of the ever changing world of amateur radio.

Trade/swap tables will be available from \$5 (depending on the size required) plus the normal admission charge. Space limitations, and the fact that the club is hiring the tables, make pre-booking necessary. Requests for disposals tables and payment must be made to the Shepparton and District Amateur Radio Club, PO Box 692, Shepparton Vic 3630.

Ted VK3MBK will provide a Melbourne contact for general information on 03 38 6842, but table bookings must be made to the club post box.

Admission remains at \$5 per head (accompanying children free) and includes the usual free tea and coffee. A two course meal consisting of a barbecue lunch with salad plus sweets for \$5 will be available. Morning and afternoon teas will also be served.

The venue will be the Shepparton Youth Club Hall located in Rowe St, Shepparton. Doors will open at 10 am. Talk-in will be provided by VK3SOL on VK3RGV, 146.650 MHz. As the repeater is located 40 km from Shepparton, call on the output if you have trouble raising it on your handheld once in the city itself!

Members of the Shepparton and District Amateur Radio Club look forward to seeing you on Sunday, 18 September and the 1994 Communications Day.

Peter O'Keefe VK3YF
Communications Day Publicity Officer

Moorabbin and District Radio Club Inc

The following persons were elected as office bearers of the club at our Annual General Meeting held on Friday 15 July 1994.

President:	Jerry Viscail VK3MQ
Vice President:	David Armstrong VK3CJ/PV/K3PNL
Treasurer:	Morne Lyons VK3BCC
Secretary:	Paul Girling VK3JKV

Committee Members

Chairman: GUY VISCAIL

President: JERRY VISCAIL

Other appointed Non Committee Members

Station Officer:	Warren Inglis VK3DWM
Components:	Chris Arthur VK3JEG
Newsletter:	David Armstrong VK3CJ/PV/K3PNL
QSL Manager:	Fred Kolb VK3CFK
Publicity:	Trevor Armstrong VK3JJR
Librarian:	Alistair Duff VK3KAD
Valve Bank:	Ken Bridger VK3JII
Combined Clubs:	Robert Zolios VK3HC

Public Officer: Ken Mills VK3TKR

Systems Manager: Simon Kay VK3KSK

WIA Exam Service Accredited Examiners

Brian Farless VK3ES

Warren Inglis VK3DWM

Paul Girling VK3JKV

Hon Secretary

Contests

*Peter Nesbit VK3APN — Federal Contest Coordinator**

Contest Calendar Sep-Nov 94

Sep 3	Panama Anniversary Contest	(Aug 94)
Sep 3/4	All Asia DX Phone Contest	(May 94)
Sep 4	Bulgarian DX Contest	(Aug 94)
Sep 10/11	World All Europe Phone	(Jul 94)
Sep 17/18	Scandinavian Activity CW	(Aug 94)
Sep 24/25	Scandinavian Activity Phone	(Aug 94)
Sep 24/25	CQ WW RTTY DX Contest	(Aug 94)
Oct 1/2	VK2LZ/Oceania DX Phone Contest	(Aug 94)
Oct 2	RSGB 21/28 MHz Phone Contest	
Oct 8/9	VK2LZ/Oceania DX CW Contest	(Aug 94)
Oct 8/9	Iberoamericano Phone Contest	
Oct 16	RSGB 21/28 MHz CW Contest	
Oct 29/30	CQ World-Wide DX Phone Contest	
Nov 12	ALARA Contest	
Nov 12/13	WAE RTTY DX Contest	(Jul 94)
Nov 12/13	OK-DX CW Contest	
Nov 12/13	ARRL International EME Competition	
Nov 19/21	All Austria CW Contest	
Nov 26/27	CQ World-Wide DX CW Contest	

Whilst looking back through the log recently, memories of my early days as an amateur came flooding back. I was 16 years old, licensed for only a few months, and the proud owner of a home brew rig with an 807 and an exposed plate pack. To achieve full break-in this rig had a keyed VFO, which was the bane of everybody else on the band due to its clicks and chirps. The more I tried to filter out the clicks, the worse the chirp became. However, the note was distinctive, to say the least!

One afternoon in late November I decided to investigate a commotion on the low end of 40 m. By the following evening

Radio Amateurs Old Timers Club

At a committee meeting in Melbourne on Tuesday, 9 August it was decided to offer honorary life membership to existing members reaching the age of 90, or who have already reached that age.

Please contact Secretary Arthur Evans VK3VQ if you qualify.

Change of 80 m Frequency

Because our evening transmissions have clashed with established operation we will be moving to 3.650 MHz +/- QRM

QSO Parties

It has been decided to move the March party to the second Monday, 6 March and the August parties to the second and third Mondays, 14 and 21 August

Allan Doble VK3AMD

I had worked an incredible 55 stations in the CQ-WW, including several new countries, and was thrilled to bits! Little did I know the contest bug had bitten.

Over the following months I found myself seeking out all the contests I could find, but there never seemed to be enough of them. The gaps between the significant ones averaged 2-3 months and, as the weeks passed, I found myself getting more and more fidgety, until the next contest "fix" arrived. But what a fix! Nothing could (or would want to) compare with the all night affairs, drifting in and out of sleep at 2:30 am whilst working stations, often wondering if the callsign you were sending belonged to someone you had just worked, or were trying to work! Many were the times I bedded down in the shack for a couple of hours, cramped and frozen, until the alarm clock went off after what seemed like only 10 minutes. How I hated that clock! But the pre-dawn opening to Europe made it all worthwhile, with stations literally pouring out of the headphones on 40 and 80 m, until the signals faded and noise levels rose around 7 am. I then stumbled into bed, woke around midday with a spinning head, and did it all again!

Didn't signals sound different in those days? Who can forget the characteristic sounds of those eastern European signals, where one could virtually identify the country by the amount of chirp? The daddy of them all would have had to be UA5ARTEK in Crimea who, on 40 m, was chirping over more than a kHz, at

stupendous strength. In fact he was chirping so much, one could even hear selective fading on the chirp! I was awestruck by that signal, and inspired forever.

Knobs had also been rotated clockwise on the other side of the Atlantic, of course, with the Ws mysteriously being one or two S points stronger, but only on contest weekends! On some signals one could literally hear the liners groaning!

As the years go by one collects domestic responsibilities, and jobs where the boss doesn't share your enthusiasm for stumbling into work at 11 am Monday morning and promptly falling asleep. Sleeping on shack floors gives way to having an alarm clock under the pillow and, as middle age approaches, the bed feels just a bit too comfortable at 4 am when, by rights, one should be enthusiastically leaping out to rejoin the fray. But, we still do it, despite our suspicion that contesting at 4 am is sheer madness and that sleeping in might be more enjoyable. Luckily such feelings quickly subside, and by breakfast time enough new stations and multipliers have been worked to have made it all worthwhile.

Yes, the contest bug has well and truly bitten! I wish you all this much fun, and more. Nothing can compare to this wonderful hobby of ours!

Thanks this month to VK1PJ, VK6APK, CQ, QST, and *Radio Communications*. Until next month, good contesting!

Peter, VK3APN

Contest Details

The following contest details are supplemented by the "General Rules & Definitions" published in April 1993 issue of *Amateur Radio*.

RSQD 21/28 MHz DX Contest

Phone: October 2, Sun 0700 — 1900z
CW: October 16, Sun 0700 — 1900z

The object is to work as many UK stations as possible on 21 and 28 MHz (UK includes G1, but not E1). Categories are: single operator, multiplier, and SWL. The CW section includes a QRP category for stations not exceeding 10 W output. Entrants using packet or DX spotting nets must enter the multiplier category. The recommended frequencies for phone are 21150-21350 and 28450-29000 kHz.

Send RS(T) plus serial starting at 001; UK stations will add their county code. Score 3 points per QSO. The final score equals the total points times the total multiplier (both bands). (The same multiplier may be claimed on both bands). Use a separate log for each band. Send logs and summary sheets, to arrive by 1 December (phone) or 13 December (CW),

to: RSGB HF Contests Committee c/o G3UFY, 77 Bensham Manor Road, Thornton Heath, Surrey CR7 7AF, England. A comprehensive range of awards is offered.

SWLs may only log UK stations making contest QSOs with overseas stations. SWL logs should be headed time UTC, callsign heard; number sent by that station; callsign of station being worked; new multipliers; points. In the column headed "station being worked" the same callsign may only appear once in every 3 QSOs except when the logged station counts as a new multiplier. HF Tx licence holders are ineligible to enter the SWL section.

Iberoamerican Phone Contest

October 8/9, 2000z Sat — 2000z Sun
This phone only contest is held each year on the weekend before 12 October to commemorate the anniversary of the discovery of America, and provides a good opportunity to work the rarer Latin-American areas. Classes are single and multiplier (single Tx); QRP max 5 W output; SWL. Exchange RS plus serial number. Bands 1.8-30 MHz. Score 3 points per QSO with a Latin-American station, 1 point with others. Multipliers are Latin-American countries: CE CO CP CR CT CX C3 C9 DU EA HC HI HK HP HR HT KP4 LU OA PY TG TI XE YS YV ZP 3C.

Additional multipliers may be claimed for contacting "multiplier stations", which can be identified by a commemorative prefix from a Latin-American prefix block followed by the year (94). Last year they were EG93G and EH93G. Final score is total QSO points times total multipliers, all bands. SWLs: the same station cannot be logged for more than 15% of the total; also the same station can only be logged again after five other entries. Send logs by 30 November to: X-Concurso Iberoamericano, Gran Via de les Corts Catalanes, 594, 08007 Barcelona, Spain.

CQ WW DX Contest

Phone: October 29/30, 0000z Sat — 2400z Sun
CW: November 26/27, 0000z Sat — 2400z Sun

Sponsored by CQ Magazine, these contests are undoubtedly the premier HF events of the year and present the opportunity to work many rare countries and zones even with modest equipment. They are open to all stations world-wide on 1.8-30 MHz (no WARC bands). Categories are: single operator; single operator low power (max 100 W output); single operator QRP (max 5 W output); single operator assisted (for those using DX spotting nets); multiplier single

transmitter; and multiplier multi-transmitter

Single operator stations can enter as single or all band, and can change bands at will. Multioperator stations must enter as all band. Multioperator single TX stations must stay on a band for at least 10 minutes, EXCEPT that one — and only one — other band may be used during the 10 minute period, if — and only if — the station worked is a new multiplier. Multi TX stations are exempt from this rule but can only radiate one signal per band at any one time

Exchange RS(T) plus CQ zone. Score 3 points for QSOs with stations in a different continent, and 1 point for QSOs with stations in the same continent (for VKs this means Oceania as defined for WAC). Stations in the same country or call area can be worked for additional multiplier credit, but have zero points value. The total multiplier is the number of DXCC countries plus zones worked. Final score equals total points times total multiplier.

Use a separate log for each band. Show new multipliers in the log the first time they are worked, and duplicates with zero points. Entrants are encouraged to include a "dupe sheet" for each band, which becomes mandatory for 200 QSOs or more. Computer logs are welcome, and must be in ASCII on DOS disk, using separate files for each band, eg VK7AAA.20 for a 20 m log; alternatively in K1EA "CT" .BIN format, eg VK7AAA.BIN. Label the outside of the disk with the callsign, the files included, mode, and category. Disks MUST be accompanied by a paper printout satisfying logging instructions. The committee may request a disk from high scoring stations to enable the log to be checked by computer, if the log originally submitted was a computer printout.

Include a signed summary sheet, showing power output for low power and QRPp entries, and send the log postmarked by 1 December (phone) or 15 January (CW) to: CQ Magazine, 76 North Broadway, Hicksville, NY 11801, USA. Indicate Phone or CW on the envelope. Numerous awards, trophies and plaques will be awarded to the leading entrants in the various categories and countries.

Results of 1993 CQ WPX DX Contest

In the CW section, the continental leaders for Oceania included VK2BQQ on 28 MHz, and VK4TT on 14 MHz. VK2BQQ was also 6th worldwide on 28 MHz.

The following results show callsign, band, final score, QSOs, and prefixes * indicates certificate winner, and # indicates low power

Phone, Single Operator:

VK5GZ*	A	4,130,580	2201	645
VK3TZ*	A	2,251,392	1346	572
VK2GAH*	A	1,350,123	1185	391
VK8AV*	A	119,598	226	186
VK3ALZ*	28	279,279	428	231
VK4UA*	14	921,717	723	423
VK2ARJ*	A#	439,880	552	280
VK3SM*	14#	57,477	173	119

Phone, Multioperator Single Tx:

VK4DMP*		485,674	567	307
VK4NEF		343,728	480	252

CW, Single Operator:

VK1FF*	A#	171,655	272	172
VK5AGS*	A#	73,788	182	143
VK2BQQ*	28#	33,449	111	83
VK4XA*	21#	178,724	286	182
VK8BE*	21#	6,732	51	44
VK4TT*	14#	134,136	247	184
P29DK*	A	175,570	308	194
P29JA*	14	147	7	7
P20PL*	A#	548,080	666	248

RESULTS OF 1993 IARU DX CONTEST

Callign/Score/QSOs/Mult/Class				
VK2VM	103,380	365	60	Mixed
VK5GN	74,965	285	55	Phone
VK2ARJ	44,400	368	25	"
VK2DID	10,740	87	30	"
VK2APK	442,720	910	102	CW
VK2AYD	238,293	603	83	"

RESULTS OF 17TH ARRL EME CONTEST

A record number of entries were received, with 215 stations submitting logs. The following results show: Call/Score/QSOs/Mult/Band (A = 50 MHz, D = 432 MHz, E = 1296 MHz)				
VK5MC	13200	7	6	D
		5	5	E
VK3OT	300	3	1	A

RESULTS OF 1994 JOHN MOYLE FIELD DAY

Presented by Phil, VK1PJ

Well, I finally got the results together. Not what I would call a large number of logs but, from the few comments I received, it appears that everyone is happy with the rules. I wish that I could have made it out into the field, though! Again, as with last year, the higher scoring entries took advantage of DX contacts. The majority of overseas stations contacted (apart from ZL) were in the USA and Japan.

Still, what is it with the majority? A lot of entrants were under the impression that they could only log VK, ZL and P2 stations. THE "JOHN MOYLE" IS NOT A VK-ONLY CONTEST! Or are we only using the weekend to get away with the boys, or girls? The "John Moyle" was

introduced as a *field day* contest to improve our operating capabilities under field conditions. To make 100+ contacts per hour would certainly stretch our skills if we continue as we are. I still heard entrants saying "sorry, only VK stations" when a pile of JA stations responded to their contest call! I operated for about 2 hours, and got around 150 contacts. Most of them were DX, with about 50 being VK/ZL. It's easy if you put your mind to it. This does not mean you have to avoid having fun. Listen to some of the USA field day events and you will hear the smile in their voices!

Congratulations to the certificate winners, and I noticed that most improved their scores from last year. I am pleased to announce that the President's Trophy was won by Laurie Pritchard VK4BLE, whose effort on CW is the best I have seen in this contest for years. Laurie will receive a plaque as a permanent record of his efforts.

The two highest scores attained by single operators were 6 hours — VK2ANK Neil Kefford, and 24 hours — VK5BW Alan Raftery.

I always appreciate comments regarding the rules and other aspects of the "John Moyle" and the few responses I have received to date have been most helpful. Hopefully, this might prompt more comments (preferably constructive!)

Well, see you all in 1995, most likely on 18/19 March. I will confirm the date in due course.

In the following results, certificate winners are indicated by *, and the trophy winner by **.

6 Hour Section Single Operator, Portable

All Band, Phone:	
VK5UE*	Cathryn Low 60
HF, Phone:	
VK6MM*	Malcolm McDonald 22
HF, CW:	
VK4BLE**	Laure Pritchard 100
VHF/UHF, Phone:	
VK2ANK*	Neil Kefford 520
VK2LRR	Lee Rainbird 284
VK4IS	Ken Hanby 176
VK3EXV	John Wright 82

Single Operator, Home

All Band, Phone:	
VK4PT	Patricia Raven 39
VK4KRR	Edward Raven 29

Multioperator, Portable

All Band, All Mode:	
VK4WIN*	Brisbane North Radio Club 330
All Band, Phone:	
VK2FRE*	Taree & District Amateur Radio Club 544
VK8DA	Darwin Amateur Radio Club 62

HF, All Mode

VK2HZ*	Bue Mountains Amateur Radio Club 350
VK4HL	Granite Belt Radio Group 150
VHF/UHF, Phone	
VK2AMW*	Illawarra Amateur Radio Society 80

Multioperator, Home

HF, Phone	
VK2MA*	Hornsby & District Amateur Radio Club 82

24 Hour Section Single Operator, Portable

HF, Phone	
VK5ANB*	David Giles 332
VK3BJN	C Welch 198
VK4EV	Ron Everingham 190
VK1MOJ	Oaf Moon 90
VHF/UHF, Phone:	
VK5BW*	Alan Raftery 2762

Single Operator, Home

All Band, Phone:	
VK2CW	Greg Smith 99
VK4IS	Ken Hanby 44

HF, All Mode:

VK1FF	Jim Muller (WB2FFY)	96
HF, Phone:		
VK4DO	Wally Watkins	49
VK3ALD	D L Robinson	8
HF, CW:		
VK3XB	Ivor Stafford	12
VK3KS	Mavis Stafford	9

Multi Operator, Portable

All Band, All Mode	
VK5ARC*	South Coast Amateur Radio Club 2752
VK4WIS	Sunshine Coast Amateur Radio Club 2606
VK6ANC	Northern Corridor Radio Group 2312
VK4CHB	Hervey Bay Amateur Radio Club 1736
All Band, Phone	
VK5DL*	Andrew Miller 3832
VK3APC	Moorabbin & District Radio Club 2938
VK2F8K	Jeff Brill 2182
VK3GH	Healesville Amateur Radio Group 1594
VK3ER	EMDRC 592
VK2WDX	Wagga DX Group 554
VK2WG	Wagga Wagga Amateur Radio Club 402
VK2BOR	Oxley Region Amateur Radio Club 276
HF, All Mode	
VK4WIT*	Townsville Amateur Radio Club 338
HF, Phone	
VK4IZ*	Redcliffe Radio Club 2860
VK2FFG	Fishers Ghost Amateur Radio Club 426
VK2EJC	John Cameron 314
VHF/UHF, Phone	
K4WIE*	City of Brisbane Radio Society 3320
	*PO Box 2175 Centfield Junction VIC 3161



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Divisional Notes

VK3 Notes

Jim Linton VK3PC

Students Study BBS

Year 11 Info Tech classes at Colac's Trinity College are the first in Victoria to use communications software as part of their required studies. Their teacher, Maggie Iaquinto VK3CFI, says for the past three years on an ad hoc basis she has shown her students how to access amateur BBS. After writing a course description and having it approved, the study of communication software types is now officially part of the students' folio work requirement.

Maggie says the Year 11 students are connecting to various BBS using PaKet 5.0, and learning how to upload and download messages and bulletins. The college club station is VK3FXQ. The other part of the folio work deals with Terminal via Windows, and Telix with the use of a null modem. The students will also tap into the WICEN Victoria BBS.

Any teacher who would like more information about this Info Tech course initiative can write to Maggie VK3CFI, QTHR.

RD Context

Did you take part in the Remembrance Day Contest? Tuning around the bands during the contest resulted in listening havoc, particularly on 2 metre simplex.

But it was really music to the ears to hear so many VK3s hard at it exchanging numbers and enjoying themselves.

Now for another question: Will your participation count? It is most important that the maximum number of VK3s submit valid entries. If you haven't sent in your cover sheet and declaration, act quickly. Entries must be in the hands of the contest coordinator, A Petkovic VK6APK QTHR, by the deadline, September 9. Don't forget to endorse the envelope "Remembrance Day Contest". The rules were on pages 33 and 34 of July's *Amateur Radio* magazine.

We must all now patiently wait about a month or so to get the contest results.

Instructor Reaches Century

Helping newcomers get into our hobby has been one of the activities of Rob Carmichael VK3DTR for a number of years. Rob is now relaxing for a few months after another hectic session of being the WIA Victoria theory instructor in the Novice class. He has also taught the amateur radio licence requirements to retired people at the University of the Third Age, USA.

Rob says he gets personal satisfaction by imparting knowledge about the theory and regulations, and the teaching of telegraphy skills. With the latest batch of successful candidates from the WIA Victoria class, he has helped 100 join the ranks of radio amateurs.



Ragchewing with some of his former WIA Victoria and USA Class students is Rob Carmichael VK3DTR.

(Photo courtesy of Leader Associated Newspapers).

Sunday Broadcast Fillip

Regular listeners will have noticed an improvement in the content of the Sunday VK3BWI broadcast. At one stage contributions fell off, leaving broadcast officer George Hunt VK3ZNE with submitted material for only about 12 minutes of air time.

A frustrated and naturally disappointed George, only a few months at the helm, scrambled to keep the weekly broadcast on air. Requests for contributions seemed to fall on deaf ears. Not even the team of announcers could collectively produce enough copy.

After a slump of six months, and considerable effort by George and other councillors, the broadcast is returning to its previous high standard. Thank you to those now supplying material, and to the regular segment anchors, John Kelleher VK3DP (DX Report) and Marilyn Syme VK3DMS (Club Net News).

Have you heard the broadcast recently? It starts at 10.30 am local time Sundays — frequencies are listed on page 3 of this magazine.

VK7 Notes

"QRM" — Tasmanian Divisional News

Robin L Harwood VK7RH

Activities during the winter months were, understandably, at a low key. But now, with the longer days and warmer weather, we look forward to increased participation. The next big activity will be Jamboree of the Air, planned for the third weekend of October. Already plans are in train for activities and stations at various locales in the State. The Northwestern Branch is mounting one station at the Parklands High School in Burnie and another could be portable within Cradle Mountain National Park. This depends on the support of willing amateurs who are able to set up at the Hut. For more details, contact Kirby Cunningham VK7KC, 17 Abbott Street, Burnie 7321, who is co-ordinating NW JOTA.

The Northern Branch will be activating their club station VK7NB as part of JOTA, from the Launceston Institute of TAFE, Alanvale campus, from 12 noon on the Saturday until 3 pm on the Sunday. As you are probably aware, VK7NB has the use of a Log Periodic beam and an FT-990, which belongs to TAFE. It helps to have VK7KJC co-ordinating this as he is deputy-principal of the Alanvale campus, besides being Northern commissioner of the Boy Scouts!

If you are interested in assisting, come and register your involvement at this

month's meeting and keep listening to the weekly Branch net on Wednesdays on the 2 metre VK7RAA repeater, or on the 80 metre relay on 3.590 MHz.

The Southern Branch activities will revolve around the Domain Activity Centre under the callsign of VK7OTC. The centre is on the site of the former VIH HF coastal radio station, hence the callsign suffix of OTC. I am sure that there will be operation also from the Lea Scout Camp, near Blackmans Bay.

I noticed that JVFAX was a popular topic at both the Northern and Southern Branch meetings in July. I believe that Bill VK7WR had an active display and demonstration at VK7OTC, while VK7NRR had a static display of JVFAX images in the North. It is certainly interesting to note the vast improvement from those first flickering monochrome pictures in the late sixties and early seventies to full colour images on your 486 PC.

Another activity was a short talk by Geoff VK7ZOO who has launched his own vineyard near Loira. Of course, we didn't neglect to taste the samples. Tasmanian wines are gathering quite a world-class reputation, particularly for Pinot Noir and Riesling.

There have been some changes to Packet BBS in Tasmania. VK7EKA, whose SYSOP was Mervyn, has permanently

gone off-line. Another BBS within the same area has come on-line. It is John VK7AD, located near Kelso. VK7YAK, with Shane being the SYSOP, located 20 miles south from Hobart, has also gone off-line for the time being. As well, the WICEN BBS at VK7AX, SYSOP being Tony, located at Ulverstone, has upgraded to a full BBS.

The September meetings in Tasmania are as follows

Wednesday, 7 September 1994 — Southern Branch General Meeting — 20:00 hours — Domain Activity Centre.
Tuesday, 13 September 1994 — Northwest Branch Meeting — 19:30 hours

Wednesday, 14 September 1994 — Northwest Branch General Meeting — 19:30 hours — Launceston Institute of TAFE, Alanvale Campus Block "C", Level 3, Room 17

Well, that's all for this month. Don't forget, if you have any news for the October column, have it to me by 5 September. Deadlines for the November and December issues are pretty tight, so I suggest you contact me direct on this as follows. Robin L Harwood VK7RH, 52 Connaught Crescent, West Launceston TAS 7250, Packet: VK7RH @ VK7BBS; E-MAIL: FIDONET 3.670/312.

How's DX

Stephen Pali VK2PS*

I have before me a handbook issued by the Ionospheric Prediction Service in 1984 and, in the preface, is the following: "The level of solar activity (sun spot cycle) is now declining and, as a result, the useable range of the high frequency radio spectrum will be reduced over the next few years. There will be a reduction in the occurrence of sudden commencement disturbances and daylight fadeouts and an increase in the recurrent type of disturbances."

Sounds familiar? Yes, it is just like the present propagation pattern. I hope you have not overlooked the fact that the above observation is 10 years old and corresponds with the ten-yearly sun cycle variations.

The IPS has a number of monitoring stations in and around Australia. These stations provide the basic data on which the daily, weekly and monthly propagation predictions are based. Information is gathered in Canberra, Hobart, Townsville, Darwin and Mudaring (WA) on the mainland, and on Norfolk Island, Macquarie Island, Vanimo (PNG), as well as at Casey, Mawson and Davis Bases in

Antarctica. In addition, there are solar observatories in Culgora, NSW and in Learmonth, WA.

Antarctica — VIOANT

Eddie De Young VK4EET will be at the Australian Davis Base in Antarctica as a communication officer for the Australian National Antarctic Research Expedition (ANARE) for the 1994-1995 summer season which is expected to last until March 1995. He will train at the ANARE Centre in Kingston, Tasmania from mid September and expects to be en route to Davis Base early in October 1994. Not much has been heard from Eddie in the last few years, but one recalls that he was part of the team with the early Rotuma DXpeditions as 3D2XX, he was active from Nauru as C21XX as well as from Wallis and Futuna Islands as FW8DY and from the Fanning Islands as VR3DY. Eddie originally hails from Honolulu and has 14 different former call signs in his DXing portfolio. Eddie is taking with him his own amateur equipment, an ICOM IC-751 and a Hustler 4BTV vertical antenna.

He hopes that a permanent amateur radio station can be established at Davis Base for the use of future hams and he is looking for donations from DX Foundations/Clubs/Associations of a linear amplifier, a Yagi antenna and a rotator for the permanent station. He could take these items on his first trip which is expected to depart Hobart, Tasmania about mid-October 1994.

The special prefix given by the SMA for this activity is VIOANT, believed to be the first VI prefix to be aired from Antarctica and which commemorates the 48th anniversary of the establishment of the Australian Antarctic Research Expeditions. Eddie will concentrate mostly on CW but, from time to time, he will visit the SSB section of the bands also. He will try to be active mainly on the 40 and 80 metre bands depending on propagation.

QSLs are to be sent to Eddie's new home address (not in the callbook yet), 131 Plantain Rd, Shailer Park, QLD 4128. Eddie, or his XYL Mina VK4BMD, can be contacted after 0800 UTC on (07) 209 9119.

St Paul Island — CY9

It was 19 years ago when St Paul Island was recognised as a separate DXCC Country. The island is located off

Canada's east coast, between the north western tip of Nova Scotia and Newfoundland in Cabot Strait (47°12' N, 60°09' W, CQ Zone 5, ITU Zone 09, IOTA NA-10). Called "Gingtao Menigog" by the MicMac Indians, Saint Paul had many names as it changed hands between the French and English before becoming part of Canada.

Its unfortunate location on one of the more heavily travelled shipping lanes at the east end of the Gulf of St Lawrence resulted in hundreds of shipwrecks on its inhospitable rocky shores and it became known as the "Graveyard of the Gulf". Modern communications and navigation equipment have, over the years, made the island less of a hazard and today fishing boats anchor off the leeward side in bad weather, but few venture close and even fewer attempt to land on the island.

Andy Rowe N0TG, Murray WAADAN, Bob KW2P and Ron AA4VK will operate with the /CY9 suffix from 19 to 25 September on 160 to 10 metres CW and SSB. They hope for better propagation at this time of the year. The sun rises on St Paul at 1009 UTC and sets at 2225 UTC. QSL to N0TG at 640 Rolling Hills Drive, Waxahatchie, TX 75165, USA.

Principality of Seborga

During July two unusual callsigns were heard on the air. The callsigns 0S1A and 0S1B were activated by the well known father and son DX team, IIRB and Paul IIRBJ. The contacts were made from there, until now, unknown Principality of Seborga which is located 20 km north from Monaco and is 517 metres above sea level.

The principality was established on 20 August 954 AD (how did they know the day and the month?). It is about five square kilometres in area and currently has 300 inhabitants. The QSL card for 0S1A states, "1st Licence of Principality of Seborga issued by OSAS the Prince Giorgio I".

Amateurs around the world went searching their maps and atlases to find this "Principality". Others studied the ITU callsign allocations to find the prefix 0S1, with negative results. A different source of information says that the Principality is located 25 km northeast from Monaco between France AND Italy and has been in existence since 1207 AD. I have no way yet to vouch for the correctness of the above information.

Paulo IZUIY was quoted in one of the packet cluster bulletins, the news originating in Europe, that the credentials of the operation are "suspect". According to him, it is alleged that, each year, the town of Seborga has a parade and names a "prince" for the celebrations. There is

also an alleged irregularity in issuing the licence and he further alleges that the Italian licensing authorities are investigating the unusual callsign.

An ARRL Bulletin issued on 21 July said that Paul IIRBJ called the DXCC Desk and reported that he returned from ITU and, under the agreement between the ITU and the Italian Government, he would now be using the callsign IS1A/0S1A. Also, there will be a one day operation by 3A2LF as 3A2LF/OSOC on 25 July in the CW mode only incidentally, according to a third source of information, "Seborga" is located 10 km north from Bordighera in Italy.

Please note, there is no DXCC status for this activity and the QSL card would have only a "cunosity" value.

ARRL DXCC and VK Listings

The DXCC program was established by the ARRL in 1937 when working 100 countries was a hard task. The very first list had a total of 112 countries and only five stations appeared on that list. The program halted during the war and recommenced in 1947 with a country list of 250.

As at April 1994 there are 326 countries on the list and the number of deleted countries has climbed to 57. Since the restart of the award program, more than 33,000 awards have been presented for the Mixed mode, over 21,000 awards for SSB and over 6,000 awards for CW activity. The July 1994 issue of QST shows 23 VK station callsigns on the "Honour Roll" as at 31 March 1994.

Mixed

VK5WO 328/361 — VK6HD 328/351 —
VK9NS 328/331 — VK3DYL 327/330 —
VK1DH 325/328 — VK5OW 325/328 —
VK9NL 324/327 — VK3AKK 320/320.

Phone

VK5MS 328/377 — VK5WO 328/358 —
VK6HD 328/350 — VK6LK 328/348 —
VK9NS 328/331 — VK4LC 327/364 —
VK3DYL 327/330 — VK3SX 325/328 —
VK5OW 325/328 — VK1ZL 324/327 —
VK9NL 322/325 — VK6RU 321/372 —
VK1DH 320/322

CW

VK9NS 328/331 — VK6HD 323/330.

The outstanding performance for low band DXCC listing was by Mike VK6HD with 332 contacts on 40 metres, 289 contacts on 80 metres and 162 contacts on 160 metres. It is also interesting to note that at 30 Sept 1993 there were two stations who received a DXCC award for 2 metre activity, SM7BAE with 102 countries and KB8RQ with 100 countries.

Future DX Activity

- DK3LQ/6W1 will stay in Dakar for several years. QSL via the Bureau

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3 ele 20 M	\$292
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- Ayman SU1AY is reported to be active. QSL to OE6EEG
- Pierre FT5XJ on Kerguelen Island was very active in the past few months on 20, 40 and 80 metres, giving VKs and ZLs the choice of working him on multiple bands. He has returned to France for a well earned rest but will return to Kerguelen in October, possibly with an amplifier. QSL to his callbook address, which is difficult to find unless you know where to look. His address is listed under the callsign of FINLL or F5NLL and is Pierre Clauzel, Le Capitaine, Plaigne, F-11420, Belpech, France.
- Charlie S92SS from Sao Tome was heard on the WARC bands early mornings Sydney time. S92YL was also active around the same time
- Burton KH2VP9BP will be active from Guam for the next two years. QSL direct to Burton S Paynter, 321 Johnson Rd, Naval Hospital, Agana Heights, Guam 96919, or via the VP9 QSL Bureau.
- Jean Louis 6W6JX from Senegal is very active on 15, 20, 30 and 40 metres around 0630 and 0930 UTC. QSL to his callbook address.
- 4J3M Yuri from Azerbaijan was active on 14180 kHz around 0430 UTC. QSL direct to UD6DJ.
- Frank AHOW will operate in September as PJ8X and as PJ7/OH2LVG.
- F6GQK is active from French Polynesia as FO5OU. QSL to his correct address, Christian Ramade, 75 Boulevard Marechal Jun, F — 33510 Andernos-Les-Bains, France (CBA address is incorrect)
- F5CQ (ex-FT5XA Rafique) will be active from Mayotte Island for about two years as from August 1994.
- Elio FH5CB is very active on 14256 kHz from Mayotte Island.
- Andy RW3AH is active in Tanzania as the chief coordinator of a Russian humanitarian UN aid team to the Rwandan refugees in Tanzania. He operates under the callsign R3ARES/SH on the 14292 net around 0700 or 1700 UTC QSL to RW3AH.
- 4X4MS is in Ghana and will stay there for one year. He operates under the call: 9G1IMH. QSL via the home call or to Box 1645 Accra, Ghana
- ET3AA is now active, operated by Lothar DJ4ZB. QSL to PO Box 60258, Addis Abeba, Ethiopia

Interesting QSOs and QSL Information

- C91AI — Diaz — 14195 — SSB — 0647 — June. QSL to CT1DGG, Jose Eduardo Madeira Cunha, Estrada Benfica 418 6-D, P-1500 Lisboa, Portugal

- VY1JA — Jay — 14227 — SSB — 0620 — QSL to Jay Allen, Site 15, Camp 117, RR2, Whitehorse, YT Y1A 5W9, Canada.
- HC8JG — Jose — 14227 — SSB — 0310 — June. QSL to WA6ZEF, Kenneth D Walston Sr, 1248N Cypress Ave, Ontario, CA 91762, USA
- KH3AF — Richard — 14227 — SSB — 0529 — July. QSL to Richard Giles, Box 976, APO AP, 96558, USA.
- T77GM — Michele — 14195 — SSB — 0447 — July. QSL to 10MWI, Stefano Cipriani, Via Taranto 80, I-00055 Ladispoli, Italia.
- P40WH — Duke — 7205 — SSB — 0651 — July QSL to WD0EWH, William A Humphrey, 9606 Grand Ave, Omaha, NE 68134, USA.
- C49C — 14162 — SSB — 0611 — July. QSL to 5B4NC, Nicosia Radio Club, OFA Building, Nicosia, Cyprus.
- YW0RCV — John — 7096 — SSB — 0611 — July. QSL to YV5AJ, Radio Club Venezolano, PO Box 2285, Caracas 1010-A, DF, Venezuela (include two IRCs).
- FH5CB — Elio — 14248 — SSB — 0415 — July. QSL to Elio Fontaine, PO Box 50, Dzaoudzi, F — 97610, Mayotte via France.
- TU2JL — Jean — 7087 — SSB — 0655 — July. QSL to Jean Levy, PO Box 1309, Abidjan 01, Ivory Coast, Africa.
- T31BB — Bob — 14195 — SSB — 0524 — July. QSL to DF6FK, Norbert Willand, Leipziger Ring 389, D-63110, Rodgau, Germany.
- C6ANI — Rick — 7087 — SSB — 0735 — July. QSL to C Ricardo E Strachan, Box N-4106, Nassau, NP, Bahama Island, Caribbean.

From Here There and Everywhere

- Mori A35MW ends his tour of duty in the Kingdom of Tonga at the end of October. Before returning to Japan he will proceed to an "exotic" (his words) South Pacific destination for a "mini expedition".
- The Peter I Island DXpedition, 3Y0PI, is available on video in PAL VHS format from Bill VK4CRR, 26 Iron St, Gympie QLD 4570.
- Mike ZA1MH is very active on all bands. He is an American missionary on the Balkan Peninsula. His wife is also active as ZA1EH.
- The proposed Truant Island activity organised by Mal VK8LC, was cancelled due to bad weather.
- The Yemen operation by Robert N4GCK has not taken place for two reasons, the civil war and political uncertainty in that region, and Robert's

legal impediment which prevents him travelling to that country

- The QSL address for the Canadian activity in August from St Paul Island with the callsign CY9CWI is WIARC, Box 884, Point-Claire/Dorval, Quebec, H9R 4Z6, Canada
- Jacky F2CW is well and alive in Croatia. He still works for the International Red Cross and has licences as 9A/F2CW and T9/F2CW. He expects to receive a 9A5CW call shortly. He is active mainly on CW with very little SSB operation. The QSL manager for Jacky's Croatian activity is KC7V
- The elusive "South Pacific" DXer who operated as VR8B, ZK2DX, ZL9A and ZL9RV (all non-existent calls) popped up as usual in the CW mode on 7002 during July. This time he used the call sign ZL8BX. He gave his name as Bob and caused havoc working the unsuspected US stations. He even made "phantom" replies to non-existent USA counterparts to "create" DX activity. I observed his method for ten minutes. He is a good CW operator, but he is a fake. There is no activity from Kermadec Island. Incidentally, he had a 599 signal in Sydney, so he is not far away
- Rudi DK7PE is back home in Germany after a short visit to Brazzaville in the Congo. He operated as TN0CW and logged about 8000 contacts. Incidentally, it took him two years negotiation with the Telecommunication authorities to receive a permit to operate.
- Erik S21ZG, a well known DXpeditioner and holder of several exotic former DX calls (home call WZ6C), has finished his tour of duty connected with a United Nations sponsored project in Bangladesh and departed for California at the end of July (see photo 1)
- Percy VK4CPA advises that the ANZA net is still operating as usual on 21205 kHz at 0500 UTC. However, due to lack of propagation on that band the net moves often to the secondary frequency of 14164 kHz for continuation of the activity.
- The widow of Marconi, the Marquise Maria Cristina Marconi died recently. She was 94 years old and married Marconi in 1927.
- If you worked CG7G, it was a special event station for the 15th Commonwealth Games that were held in Victoria, BC, Canada. The station was active for two months from 1 July to 31 August. QSL to VE7RCN.
- Peter V85PB has completed his tour of duty and returned to the UK. QSL for

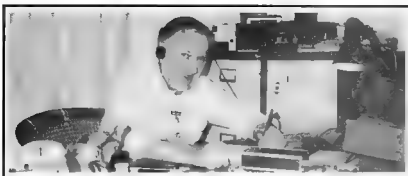


Photo 1 — Erik S21ZG has returned to the US after many years of overseas activity.



Photo 2 — Gene TL8NG finishes his tour of duty in October this year.

V85PB contacts via the RSGB QSL Bureau to G3ZSS.

- The Taiwanese Ministry of Post and Telecommunication announced that BV amateurs are now permitted to work on the following frequencies: 3500-3512.5, 3550-3562, 18068-18080.5, 18110-18122.5, 24890-24902.5, 24930-24942.5, 50000-50012.5 and 50110-50122.5 kHz.

• QSL cards to EZ Turkmenistan (formerly UH8/RH8) should be sent via the new QSL Bureau for that country. The address is PO Box 555, Ashgabat 20, Turkmenistan 744020. Do not send cards via Box 88 Moscow.

- The DXAC has received a new petition from W9ARV to add the Balleny Islands to the DXCC countries list. The islands are located in the Antarctic, 66°55' South and 163°20' East.

- According to a news bulletin from RAC (Radio Amateurs Canada), the Canadian regulatory authority, Industry Canada, has issued a new ruling on the use of special prefixes by Canadian Amateurs. The table before me shows that the nine call areas of Canada, plus Newfoundland (VO1), Labrador (VO2), Yukon (VY1) and Prince Edward Islands (VY2) areas have 194 (yes, you read it correctly) combinations of special prefixes for possible future use. And we, here in VK, are struggling with only two special prefixes, AX and VI Stations with CY9 (St Paul Island), CY0 (Sable Island), VE (ship board stations) or VY9 (Industry of Canada) callsigns are not eligible to use any special prefixes.

- Due to recent increases in postal charges in Venezuela, one IRC will not cover return postage.

- For the past four years one of the strongest signals out of Africa to VK and ZL has been that of Gene TL8NG. He is a regular visitor to various nets, and is very obliging to ensure that the rest of the world has a valid contact with the Central African Republic.

Gene is there working on a United Nations sponsored agricultural project. He is "in the Bush" about 300 km from the capital of Bangui and from the nearest telephone and modern conveniences. The project Gene is working on will end in October 1994. He will then return to the USA. If you have not worked Gene yet, hurry up. There are only a few weeks left before TL8NG will be silent. Gene's QSL manager is WA1ECA who provides an attractive QSL card (see photo 2).

QSLs Received

WA8RYW/VV5 (3M VK4MZ), OM3CCC (4W op), S21ZG (5M W4FRU), TL8NG

(6W WA1ECA), FK8FA (2M op), CY0DX (1M VE1AL), HJ7TMK (7M op), PA3CXC/ST0 (9M op), N9JCL/CY8 (3W K0SN), VR6MW (3M op).

Thankyou

Many thanks to the contributors of this column. All of you were helpful, especially VK2KCP, VK2KFU, VK3T1, VK4AAR, VK4EET, VK4CRR, VK5WO, CY9CF, WA1ECA, W4FRU and the publications QZ DX, The DX Bulletin, The DX News Sheet, The W6GQ/K6HHD list and IPS Radio and Space Services.

*PO Box 93, Dural NSW 2158

Over to You — Members' Opinions

All letters from members will be considered for publication, but should be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

SEANet '93 and '94

Thanks for the good exposure in the July edition of *Amateur Radio* on SEANet '93.

Since that piece was written in February, Sangat Singh 9M2SS has changed his preferred address for correspondence relating to SEANet '94.

His full, revised contact details are as follows:-

Mr Sangat Singh 9M2SS
Secretary — Organising Committee
SEANet '94
111 Jalan Terasik Lapan
Bangsar Baru
59100 Kuala Lumpur
MALAYSIA.
Tel: +60 (3) 256 1571
Fax: +60 (3) 253 7373

David Rankin 9V1RH/VK3QV
PO Box 14
Pasir Panjang
Singapore 9111

School Radio Clubs History Sought

We are looking for information on amateur radio stations which operated as either school club stations or simply from schools before 1940. The earliest record we have is of 3GZ, G S C Semmens, which was operated from the woodshed at the Buln Buln State School from 1920 to 1923. 3GZ thought that this was the first station operated from any state school, perhaps from any school.

According to 3GZ "the pupils listened to a half hour broadcast from a station in Melbourne once per week plus the odd transmissions. The transmitter was a Myers valve heated from a lead battery. The capacitors were made from kerosene case wood boiled in wax paraffin, coated with silver paper and hinged as in a book".

Can anyone do better than the Buln Buln State School woodshed? Or even nearly as well. We would be pleased to have any information from before 1940

We are also collecting information about the many local clubs which functioned all round the nation before the dramatic improvement in transport, and the impact of talking pictures caused them to amalgamate or simply fade away. Some of their successors still exist; the Geelong Amateur Radio Club following the Geelong Radio Club of the 1920s is a good example. Information on the small suburban and village clubs is being collected so that it isn't lost as it soon will be if we don't at least gather it up.

John Edmonds VK3AFU/ATG
Federal Historian
"Woorak" 515 Willowite Road
Morialac VIC 3240

Limited Licensees and 10 Metres

I was amused by Mr G J McDonald VK2ZAB's article consisting of nearly a half page of complaints directed to the WIA for failing to do more for access to the 10 metre band for limited amateur radio operators.

Congratulations to you for having been a limited licensed operator for 37 years. Just imagine, 36 years and 9 months ago you could have had access to most of the 10 metre band, by passing a CW test at a lousy 5 wpm; 36 years and 6 months ago you could have had access to the whole amateur band spectrum by improving your CW and passing 10 wpm.

Jack Van Schaik VK3AAC
26 Thorpdale Street
Newborough VIC 3285

Adjusting and Cleaning Speed Keys

Doc's article in July 1994 issue of *Amateur Radio* was very good, and I would like to suggest a refinement by using a multi-meter. In the Ohms position, set it to full scale, connect the "Bug" and fine-tune the dots for a half scale reading to obtain an equal mark space ratio. On my "Automotive" key I then set the dashes to read 75% of full-scale to obtain the correct mark/space ratio.

Vic Kitney VK7VK
Gordon Street
Swansea Tas 7190

Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the passing of:
W H Thurman VK3VGY

Packet World

Grant Willis VK5ZWI*

Mail Forwarding Part 2

Last month I wrote about how a packet message is forwarded through the BBS network. The next stage is to look at the White-Pages system.

White-Pages is a database system, maintained by a fair number of the BBS stations around the world, that contains a list of known packet stations and the home BBS where you can send packet mail to them. This database is automatically updated by the BBS programs and gains much of its information by scanning the BBS headers of every bulletin and personal message that passes through the BBS station. Information is also supplied by each user when they are asked to register their details with the BBS program. The information entered in the "N" commands, or via the "REGISTER" command on some systems, eventually finds its way into the White-Pages databases and can then be accessed by anyone.

When you are entering information, there are a series of commands to use. On the FBB BBS program the commands to enter this information are:

N — Enter your name
NH — Enter the callsign of your home BBS station
NZ — Enter your postcode (sometimes called Zip code)
NQ — Enter your Location

The NL command is also available which is for you to enter your Maidenhead Grid Square locator number (eg PF95GA).

This information is then used by the BBS to assist others in sending messages to you. This information is also shared between BBS stations, which once a day generate an update message which they forward on to other BBSs allowing the most up to date information to be propagated.

Entering all this information is fine, but you will also want to be able to retrieve information about people. This is done using the "I" command on many BBSs. Some of these commands include:

I [callsign]
I@ [BBS-Callsign]
IH [H-Address Designator]
ID — Gives the size of the local WP Database

If you wanted to query the database and ask it to list the home BBS for a friend, eg you wanted to find the BBS address of VK2XYZ, you would send the command "I VK2XYZ" and the BBS

would answer either with the record it has for that station or an error message if the person is not known on the database.

Sometimes you will find that your local BBS may not run White-Pages, or may have a relatively small White-Pages database (due to disk capacity, memory capacity or perhaps they haven't been running WP very long). There are, however, some BBSs with very large databases that you can enquire at. To do so, you send a message to the "WP" server with some commands in the message. For example, to query VK5ZWI's White-Pages for the address of someone in the USA, eg AA4ER, you would send a message like:

BBS Prompt>
SP WP@VK5ZWI <— You Type
Enter the Subject of your message
WP Request <— You Type
Enter the body of your message
? AA4ER <— You Type
/EX <— You Type
BBS Prompt>

When the message you have sent arrives at VK5ZWI, it will be processed and a reply generated with the information you seek.

There are also ways of extracting groups of callsigns from the database. In both forms of query it is possible to replace part of the callsign with a * which is known as a wildcard. Everything after the * is considered as a match in the search and a query like "I VK5*" would result in the database sending you a list of every VK5 callsign known to the system.

If you have problems using any of the I or N commands on the BBS you should contact your local BBS system operators and ask them to give you a hand.

One other feature of White-Pages that is really nice is in the case of sending packet mail. If you don't know the full address of a station and only enter, for example, the callsign of the destination BBS and not the full Hierarchical address, the BBS software will look up the database automatically for you and add the information required.

Conclusion

That's all for this month. Next month I will look at what's required to set up a basic packet station and also mention some of the good beginners' programs available for a variety of personal computers.

If you have anything you would like to see covered in the *Packet World* column, please send your suggestions or contributions to me. I can be reached on packet at VK5ZWI@VK5TTY.ADL # SA AUS.QC or by post to GPO Box 1234 Adelaide 5001.

*GPO Box 1234, Adelaide SA 5001 **ar**

Pounding Brass

Stephen P Smith VK2SPS*

Well, it's that time again to put pen to paper and write another issue of "Pounding Brass" (boy where does the time go?) Just a couple of points I would like to make before I conclude this series on Morse practice tapes. I was thinking it's approaching the end of June and what a hectic month it's been. We just had the house re-carpeted and everything had to be moved, radio equipment disconnected and packed. It was a nightmare. I was surprised at how much stuff one accumulates over the years. However, things are starting to get back to normal.

The "CW Operators QRP Club" recently had their QRP weekend contest on the 11 and 12 June. Participation was good and many contacts were made on just 5 watts. On the subject of QRP the above club runs "Scrambles" at least once a month. Basically, a scramble is to work as many stations as possible within a given time frame of anywhere between one and a half to two hours, very similar to "Sprint Contests" which are of shorter duration. All scrambles are held on 80 metres. I hope to include the rules and dates for future scrambles in a later issue.

Remember, if you hear someone calling "CQ Test de VK2XX/QRP", give them a report. They will really appreciate the contact and, of course, the points. The Novice contest on the 17 & 18 June attracted quite a few new stations and was well represented in section "B" with the old hands again giving great support. I would like to have seen more participation from Novice stations in the CW category. My log for the contest shows about twenty five Full Call stations and only three Novices. All I can say is "Come on guys, it's your contest, support it!" (results should appear around the October issue of *Amateur Radio*).

Moving along we will now look at the WIA Morse practice tapes which also cover the beginner's course. However, before we look at how the course is structured, a little history is called for. "The Learning Morse Kit", which includes a training manual and three cassette tapes, was designed by Rex C Black VK2YA back in 1977. Rex was the founder of the WIA Youth Radio Service. He was also ex Royal Australian Corp of Signals, former chairman of the WIA Novice Investigation Committee, and ex subject master and Education Officer of the Education Service, WIA NSW Division.

Rex also writes and produces cassettes, all with a standard "hand key", for the Education Service. It is only in

recent years that the cassettes have been recorded by computer. Rex was a foundation member of the WIA NSW Division Education Service and is still involved with the slow Morse program run by the NSW Division.

With Rex's credentials, and his love for Morse, you are certainly getting a very professionally presented course, and one of the best on the market today. "The Learning Morse Code Pack" (as it is now named) contains copies of the original tapes made by "hand key" and it is hoped that, in the not too distant future, they will also be computer generated.

The Course is available through the Education Service, WIA NSW Division, PO Box 262, Rydalmere NSW 2116. The cost is \$11.50 including postage (discount to members). The course includes three 60 minute cassettes, a 48 page manual which includes 120 programmed steps keyed to a comprehensive text and spoken prompts, an eight page introduction, and a wealth of other very useful information such as Receiving the Code, Sending the Code (including photographs on how to hold the key, how to sit, etc), Q-Code, Audio Oscillator Circuits and a circuit of a 12 watt 3 valve Tx. I have only scratched the surface as there is too much information to include here.

I should also bring to your attention that the Education Service can supply you with Morse cassettes ranging in speed from 4 wpm to 30 wpm with three texts A, B & C. Included in their stock are special examination cassettes for the Novice and full call candidates. They can also supply all kinds of recorded cassettes which include random generated alphanumeric with a range of different spacing ratios. All tapes are 60 minute and sell for \$4.00 inc postage.

Further enquires can be made to the

above mentioned address or you can contact the Education Service on (02) 622 6240. There is so much information contained within these cassettes that it is impossible for me to include it here for your review. The method of teaching is very similar to the "Marconi Radio School" which, if you remember, was situated in York St, Sydney many years ago. It's just too hard to resist a sneak preview.

Cassette 1 side 1

Step (1) Group (1) Consists of letters E, I, S, H and the number 5.

Practices:

1. 10 symbols W S I H S E, etc.
2. 10 symbols " " " " " "
3. 5 triples E S H, E S S, etc.
4. 5 triples " " " " " "
5. 5 triples " " " " " "

Get the idea?

Steps 1 through 15 cover cassette 1 and 2 which cover the alphabet numbers and operating signals. Cassette 3 consists of more practice exercises (short sentences with numbers) at a speed slightly faster than the examination.

Talking about manuals for a moment, a number of courses currently on the market today only include a brief introduction along with the required exercises, and no further information is included. I suppose this is to cut down on production costs.

Good luck with your training. Remember, short and consistent lessons are the key.

I'm unable to report on the RSGB course at this time. If anyone has a current copy of the RSGB course, and doesn't mind lending it to me for a few days, I would like to hear from you.

Remember, "Europe for QRP weekend 94" from 1600 UTC on 7 Oct to 2359 UTC 9 Oct. Call CQ-EU-QRP on all recognised QRP frequencies. If you would like a copy of the event drop me a line, or see "Sprat No 78" from the "G-QRP Club" for further information.

*PO Box 361, Mona Vale NSW 2103

An Old Timer Reflects....

Des Greenham VK3CO* continues to look back over 50 years of amateur radio operation.

In the old days, we had no coaxial cable or any other form of transmission line. We had copper wire and we had "hook-up" wire and from these two products we made our antennas. We had no plastic; this came long after World War 2. We did have "porcelain" egg insulators, these being used by normal radio listeners who used high, long wire antennas for their crystal and simple valve receivers.

The "Yagi" beam antenna was unknown, as was any directional beam. The most common antenna was the faithful "Zepp" antenna, so named after the German prewar airship, Zeppelin. The Germans had devised a simple half wave radiator fed with a tuned, spaced line. This antenna was hung under the airship and apparently worked well.

This Zepp antenna was very popular

with the amateurs of the day. The antenna was a half wave wire strung up between two trees or poles and fed with a tuned balanced line. The feed point for the true Zepp was at one end. When fed in the centre the antenna was incorrectly known as a "Centre fed Zepp". The Germans never fed their antenna in the centre.

The feed line was usually made from hook up wire which was flexible and the spacers were made from wood (remember, plastic was not with us at this time). The wooden spacers, usually about 12 mm diam and 100 mm long, were boiled in beeswax to make them waterproof and also to make them non absorbent. The feed line length was quite critical, and had to be either an even or odd number of quarter wave lengths. This then presented a high impedance or low impedance feed point in the shack.

It was common to bring the spaced feedline into the shack through holes drilled in a window. Not an easy task. Many operators fed the two wires in above the door, under a window, etc, keeping in

mind that the line was "hot" and had to be kept clear of just about everything.

Then came the problem of matching the line to the transmitter. This was done by an antenna tuning unit consisting of a resonant tuned circuit wired up either in a series circuit, if you needed a low impedance feed, or in parallel if you needed a high impedance feed. Either way, you had VERY high RF voltages around the shack.

It was common to wire in two car 12 volt headlight globes in series with each leg of the feedline to see what current was flowing. This was only when the antenna was series or low impedance fed.

Then, just after the war, came this new coaxial cable. Certainly it had higher losses than our open wire lines but it really was very convenient. We could bring it into the shack over or under the roof with no insulation worries and no high voltages around the shack.

Life was made so much easier.

**16 Clydesdale Court, Mooropna VIC 3629*

Spotlight on SWLing

Robin L. Harwood VK7RH*

September has come, and with it Spring! New life is sprouting up after winter's chills, the wattles stand out, gently swaying in the breeze. Yet, as I'm writing this month's column, I just have to gaze out of the window to Mount Barrow, to the east of the city, and see a thick mantle of snow.

Radio propagation has been patchy of late, particularly on the higher frequencies. I notice that there often is a complete absence of signals, especially on the east-west path. Radio HCJB in Quito, Ecuador usually is loud and clear on either 9745 or 11925 kHz from 0700 UTC, but has been weak to unreadable at times. Also, the Bonaire relay of Radio Netherlands on 9630 and 9720 kHz sometimes is absent. European and American signals also are noted for the lack of penetration on 14 MHz and it is to be hoped that propagation picks up for the VK/ZL contests and JOTA, next month.

While monitoring the 40 metre amateur allocation for Intruder Watch, I came across a very unstable signal around 7085 kHz from approximately 1200 UTC. A bad hum completely overrides the modulation at times and the carrier drifts rapidly up or down. Listening carefully, I was able to identify an English language announcement, "This is Radio Pakistan and here is the News!". I was hearing a relay of the domestic network and an old WRTM showed the location as being at Karachi.

The Korean Peoples' Democratic Republic has been in the news of late, following the death of Kim-Il-Sung, better known as "the Great Leader". The many clandestine outlets on the lower frequencies were silent for a few days, but not the jammers, who continued interfering with open carriers or, when there was audio, solemn music. The jammers are believed to be in South Korea. Pyongyang, the North Korean capital, continues to jam all shortwave broadcasts in Korean, particularly from the South, but of late has been targeting religious programming in that language from KWHR in Hawaii at 1300 UTC. Radio Pyongyang is heard in English on 9977.2 or 6576 kHz at 1100 to 1145 UTC.

The 9th edition of Ferrell's *Confidential Frequency List* has recently been published. This listing of utility stations from 1.6 to 30.0 MHz has taken note of the changes and alterations in the Maritime and aeronautical areas following

WIA News

Reciprocal Licensing Update

Agreements for reciprocal licensing, permitting amateurs from Australia to operate in overseas countries without having to sit an examination there, and vice-versa, have been in place between Australia and various countries for many years. A separate bilateral arrangement exists with each country in the scheme.

Presently, 16 countries have reciprocal licensing arrangements with Australia and negotiations are under way with at least seven more.

These 16 countries are:

Canada
Denmark
France (inc. New Caledonia)
Germany
India
Israel
Japan
Malaysia
New Zealand
Papua New Guinea
Poland
Solomon Islands

Spain
Switzerland
United Kingdom
USA

Countries with which reciprocal agreements are currently under negotiation are:

Austria
Greece
Italy
Kiribati
Peru
South Korea
Vanuatu

With the likelihood that Australia will enter an agreement with CEPT (European Conference of Postal and Telecommunications) countries for short term visitors, then perhaps the protracted time and effort currently needed by the Spectrum Management Agency and the Department of Foreign Affairs and Trade to effect reciprocal licensing agreements will disappear.

However, bilateral agreements between Australia and other countries for permanent residents in Australia from overseas will still be necessary.

deregulation. It includes details of the various modes employed, a few of them so new that there aren't any decoders commercially available to resolve them. I purchased my first Tono 9000E about 11 years ago and I was able to decode quite a number of RTTY press services on HF. Then I managed to acquire a Tono Theta 777 decoder about 6 years ago and upgraded to AMTOR/SITOR. But, in the past four years, there has been such a proliferation in new modes that the Theta has been left behind. Such a large proportion of the press services have gone to data links on cable and satellite that HF RTTY has only North Korea,

Morocco and Taiwan left on a regular basis.

I find that CFL9 is still extremely useful in identifying signals and locations despite a few shortcomings, namely the listing of Australian coastal radio stations that have since ceased part or all of their schedules. For example, VIH Hobart Radio is listed as still being on 5355 kHz when, in fact, it ceased about three years ago. Also, a string of VIS Sydney Radio at a frequencies are listed despite being phased out about 12 months ago. As well, the Sydney-Antarctica links are still listed, as are the Norfolk and Lord Howe circuits. Both of these are now on either

INMARSAT or Optus-B. I don't think that the author can be blamed for this as the onrush of technology is so rapid. CFL9 costs \$50.00 and I obtained my copy from Arthur Cushen, 212 Earn Street, Invercargill, NZ, but you may miss out as it was a limited order.

Don't forget that I now have an e-mail address. It is FIDONET 3 670/312. INTERNET: Robin Harwood @ p0.f312.n670.z3.fidonet.org or, alternatively, to VK7RH @ VK7BBS #LTN.TAS.AU.OC.

*54 Connaught Crescent, West Launceston, TAS 7250

■

Repeater Link

Will McGhie VK6UU*

FM 828-0

There are two circuits remaining of the Philips FM 828. This month's circuit is the microphone amplifier. This circuitry separates the good transmitters from the bad. The right pre-emphasis, overall frequency tailoring, and audio clipping are all important to produce good audio. The mic amplifier in the FM 828 does all these things well.

Note the mic gain pot R115, an all important adjustment for correct audio clipping. Too much mic gain and your audio is distorted and picks up excessive

road noise if you are mobile. Too little mic gain and your fellow amateurs have to ride the volume control and strain to hear you if they are mobile. I believe the best audio reports come from mobile operators. Amateurs sitting at home in a quiet environment can easily compensate for poor audio.

The FM 828 mic amplifier is a particularly good one and is more than just an amplifier. Its operation is described in the manual and is worth reproducing.

"Transistor TR21 is a pre-amp followed by C84 and R107 that provide pre-emphasis. Clipping for deviation limiting comprises two stages, an active clipper TR20 and passive clipper D10, D11. The combination results in symmetrical time amplitude clipping, giving low distortion and good limiting characteristics over a large input range. Network R98, C78 provides de-emphasis after the clipper, and is followed by buffer TR19. The low pass active filter TR18, TR17 limits the audio frequency bandwidth to 3 kHz and provides a cut-off rate of 20 dB per octave from 6 kHz to 12 kHz. Transistors TR15 and TR16 are the deviation amplifiers which drive the phase modulator. R81 is the deviation control."

All that to achieve good audio! Not as simple as you thought? Correct adjustment of the mic gain and deviation controls are important. Yes, I know I have said it before.

Finally, next month, the last of the FM 828 CAD circuit drawings. I have the layouts of the circuit boards almost finished but, at this stage, do not plan to reproduce them in "Repeater Link". If there is a demand, however, they can be included. All these circuits and layouts are available on computer using Draft Choice and via Packet radio.

29 MHz FM

The 29 MHz gateway system is such a clever idea that it had to run into a problem somewhere, and it has. It's not legal! The SMA in Perth have pointed out that one 29 MHz gateway on a given frequency may be legal, but two on the same frequency are not. The reason being the potential for two gateway systems to link together and, as there is no agreement on link frequencies on 29 MHz between the WIA and the SMA, it is not permitted.

Further investigation has indicated that only the band between 29.5 MHz and 29.7 MHz can be used for connecting an existing VHF/UHF repeater. Also, I assume the 10 metre system must be a repeater in its own right. Such a system is used in Melbourne where the 10 metre repeater VK3RHF is connected to a UHF port.

For a hobby there sure are a lot of detailed regulations! How can amateurs be progressive when the framework is so rigid? Any new ideas often face an uphill battle. The new regulations are supposed to solve much of this problem, one day.

Now starts the long process of making 29 MHz gateway linking legal. Proceedings started in VK6 on 10 July 1994 by writing a submission and passing it onto our local WIA. If it receives local support it then heads East in the hope that it will become Federal policy.

I will keep you informed as to the progress of this submission and the complex means by which it moves from original idea to finished regulation.

Regulation I sure hate that word!

*21 Waterloo Cr Lismurdie 6076 VK6UU @ VK8BBS

■

QSP News

Christine Goode Appointed as Spectrum Manager

In a Media Release dated 22 July 1994 from the Department of Communications and the Arts, Minister Lee announced the Federal Government had today appointed Ms Christine Goode as the head of the Spectrum Management Agency (SMA), the organisation charged with the management of Australia's radiofrequency spectrum.

The WIA is pleased at Ms Goode's appointment and has sent her a congratulatory letter.

■

VHF/UHF — An Expanding World

Eric Jamieson VK5LP*

All times are UTC

Australian Amateur Bands Beacons

Frequency	Call sign	Location	Grid square
50 046	VK8AS	Alice Springs	PG66
50 0535	VK3SIX	Hamilton	QF02
50 0567	VK7RNW	Lonah	QE38
50 057	VK8VF	Darwin	PH57
50 058	VK4RGG	Nerang	QG62
50 066	VK6RPH	Perth	OF78 off air at present
50 0775	VK4BRG	Sarina	QG48
50 087	VK4RTL	Townsville	QH30 proposed
52 326	VK2RHV	Newcastle	QF57
52 345	VK4ABP	Longreach	QG26
52 410	VK1RCC	Canberra	QF44 ?
52 420	VK2RSY	Sydney	QF56
52 425	VK2RGB	Gunnedah	QF59
52 440	VK4RTL	Townsville	QH30
52 445	VK4RIK	Cairns	QH23
52 445	VK4RBM	MacKay	QG48
52 450	VK5VF	Mount Lofty	PF95
144 022	VK6RBS	Busseton	QF76
144 400	VK4RBB	Mount Mowbrall	QG62
144 410	VK1RCC	Canberra	QF44
144 420	VK2RSY	Sydney	QF56
144 430	VK3RTG	Melbourne	QF20
144 435	VK3SIX	Hamilton	QF02
144 445	VK4RIK	Cairns	QH23
144 445	VK4RTL	Townsville	QH30
144 445	VK4RBM	MacKay	QG48
144 451	VK5VF	Mount Lofty	PF95
144 460	VK6RPH	Perth	QF78
144 465	VK6RTW	Albany	QF84
144 470	VK7RMC	Launceston	QE38
144 4746	VK7RNW	Lonah	QE38
144 480	VK8VF	Darwin	PH57
144 485	VK8RAS	Alice Springs	PG66
144 530	VK3RGL	Mount Anakie	GF22
432 066	VK6RBS	Busseton	QF76
432 160	VK6RPH	Perth	OF78
432 410	VK1RBC	Canberra	QF44
432 420	VK2RSY	Sydney	QF56
432 440	VK4RSD	Brisbane	QG62
432 445	VK4RIK	Cairns	QH23
432 445	VK4RTL	Townsville	QH30
432 445	VK4RBM	MacKay	QG48
432 450	VK5VF	Mount Lofty	PF95
432 450	VK3RAI	MacLeod	QF22
432 474	VK7RNW	Lonah	QE38
432 5339	VK3RMB	Mount Buninyong	QF12
1296 198	VK6RBS	Busseton	QF76
1296 410	VK1RBC	Canberra	QF44
1296 420	VK2RSY	Sydney	QF56
1296 440	VK4RSD	Brisbane	QG62
1296 445	VK4RIK	Cairns	QH23
1296 450	VK5VF	Mount Lofty	PF95
1296 470	VK7RAE	Devonport	QE38
1296 480	VK6RPH	Perth	OF78
2304 445	VK4RIK	Cairns	QH23
2306 440	VK4RSD	Brisbane	QG62
10445 000	VK4RIK	Cairns	QH23

Would beacon custodians inform me of additions and/or corrections please. It is some time since the list was upgraded. I will run the list again in three months time so your advice is required urgently

Local News

The lack of communications is obviously a reflection on the degree of activity on the various bands. 10 GHz continues to absorb the interests of a number of operators as they find how rewarding operation is using narrow band techniques. In fact, it is quite staggering the ease with which some contacts have been made. More on this later.

There was quite a good two metre opening between VK5 and VK3 on 23/7 between 0100 and 0140. Roger VK5NY had some good contacts and I managed to work Norm VK3DUT on 50.150, 144.150 and 432.100 with signals peaking to S9 on 144.150. I also worked Gil VK3AUJ on 144.150.

I don't think the band faded out immediately because the VK3RGL beacon was there until well after 0200 so, obviously, no operators were available. VK7RNW at Lonah was also audible but there were no VK7 operators. The following day, 24/7 at 0120, VK3RGL was 529 and VK3SIX 539.

Ron Cook VK3AFW sent a fax to say that on the weekend of 9/10 July, Roger VK3KRS worked Mike VK2FLR Sydney 5x1 and VK2ZXT Port Kembla 5x7 via two metres aircraft enhancement. The two paths of approximately 540 and 460 km were over mountainous terrain and speaks well for the efficiency of the two operators/stations involved.

Ron also said that in the absence of Ian VK1BG and Gordon VK2ZAB the aircraft enhancement frequencies have been quiet. Norm VK3DUT is a regular but other VK3s in the Melbourne region are notable by their absence.

John VK3ATQ from Berwick returned last year to 6 m SSB and has been heard on 2 m SSB. He reports disappointment with the lack of activity on the tuneable end, particularly compared to the 1960s. I can certainly relate to that; it was much easier to obtain contacts during the AM days than at present.

Ron said he continues to work Andrew VK7XR each weekday morning on 144.080 CW. Occasionally, signals are of sufficient strength to allow good SSB contacts which indicates that tropo enhancement does exist in winter! Following the contact with Andrew, Ron turns the beam north and speaks to Des VK3CY at Wedderburn. SSB signals are usually 5x8/9 with QSB down to S6 on poor mornings.

GUIDE TO UTILITY STATIONS 1994

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The frequency list now includes more than 15,000 entries. A new index covers 2,000 stations in country order with all frequencies for rapid access. Up-to-date schedules of weatherfax stations (including Auckland, Casey, Darwin, Guam, Honolulu, Melbourne and Tokyo) and teletype press agencies are listed both alphabetically and chronologically. Abbreviations, addresses, call signs, codes, definitions, explanations, frequency band plans, international regulations, modulation types, NAVTEX schedules, Q and Z codes, station classes, telex codes, etc. - this reference book lists everything. Thus, it is the ideal addition to the World Radio TV Handbook for the "special" stations on shortwave!

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From the UK

I have a two months coverage of news from Ted Collins G4UPS. In the June issue he reports an unusual beacon, S22DF on Crete. It operates on 50.521 MHz running one kilowatt of continuous carrier to 4x16 element Yagis beaming 330 degrees. There is no ident but pressure is being applied to the University of Iraklion to install identification. With that degree of continuous key-down power one would hope that the cooling system does not fail!

Contacts across the Atlantic commenced on 15/6 between 2230 and 2300 to VE9AA, VE1YX, VE1PZ and K0SN/CY9. On 19/6, 1930 to 2015, VE3FIT, W2CNS, VE1RAA, NW3C. The first wide spread opening occurred on 25/6 from 1630 to 2310 with the greatest distances being worked to W5EU and NSJHV.

The European ES season has brought many stations, including beacons, from the woodwork. The following countries were included in the June and July listings, with many being worked several times. 4NSIX, 4X1IF, 9A2BZ, 9H1BT, 9K2ZR, CS8CB, CT4KQ, CU3URA, DK5RQ, EH1EH, EH8ACW, ER5OK, F5BUU, F5ZEK, F7YSIX, HB9FMAR, HV4NAC, IK2UIX, IS0AGY, JX7DFA, JY7SIX, K1JRW, K2OU, K4SC, K8MFO, LA8ZV, OD5SIX, OE1ETA, OH2AZR, OK1TS, OX3LX, OZ7IGY, PE1LAU, R3VHF, RA3UY, S5ZRS, SM7AE, SP8MMZ, SV1SIX, SV8ANK, TK/F5HRY, VE1RAA, VE3FIT, VO1ZA, W2CNS, W3EP, W4WHK, W5EU, W1AYS, WB2ELB, WB4NFS/VP9, YO7VJ, YU7AS, ZB2EO.

It is a note that many contacts were made with Italy, Poland and Yugoslavia which tends to indicate they are situated at distances best suited to Es. During June, 26 beacons were logged.

Ted also advises that from 18 July 1994, Class A and B operators in the UK on six metres have been granted a power increase from 100 watts to 400 watts and with antenna restrictions lifted. The increase is permitted from 50 to 51 MHz but remains at 100 watts from 51 to 52 MHz. UK amateurs are now permitted to operate maritime mobile on six metres. Ted comments it seems rather odd that this increase should be made when most keen six metre buffs have worked more than 100 countries with the 100 watts ERP restriction.

Geoff GJ4ICD from Jersey Island confirms the excellent openings detailed by Ted, stating that, during a massive opening on 50 MHz, he worked country number 149 on 25 June with a contact to WB4NFS/VP9 in Bermuda, square FM72. During the same period W5HUQ in EM70 was 599+ for more than an hour. The next day the band was dead.

Geoff said June 1994 should go down in the record books for Es openings on 50, 70 and 144 MHz. On 17/6 9K2USA and 9K2ZR were worked and monitored for over five hours at a distance of around 4,600 km from Jersey. An interesting contact on 19/6 was FP5EK (St Pierre and Miquelon off the coast of Canada) to Jersey, the UK, PA0 and DL. At the same time the band was open to USA and Canada.

The Jordanian DXpedition in which Geoff was involved during May/June had around 2,000 50 MHz QSOs in nearly 50 countries, but only a few contacts were made on 144 MHz. I am told there is more news to come plus some photos, so I await these with interest.

Emil Pocock W3EP reports on the beacon situation in the USA. Bill Tynan W3XO was instrumental in arranging for the first 144 MHz beacon to go to air during June 1978 for a six month's experimental period only. It was not until January 1983 that unattended beacon operation was permitted in specific sub-bands from 50 to 432 MHz and anywhere in the higher bands. Currently there are more than 100 VHF, UHF and microwave beacons in the US and Canada. Any US amateur with a Technician license or higher can put a beacon on the air without any formalities, official registration or notification. As Emil mentions, keeping track of these beacons has been challenging.

Emil is planning to provide a beacon list as part of his *The World Above 50 MHz*, firstly from those owners or trustees who responded to his recent questionnaire. I can only hope that he has more sustained luck than I have had whilst attempting to keep a reliable list of Australian beacons over the past 30 years. Some trustees have been most helpful in advising the status of their beacons whilst other beacons fall into a state of disrepair without advice from their owners. But that's human nature and I have learned to live with such a situation.

Planet Jupiter

In a brief message, Doug VK3UM advised that during the recent comet collisions with Jupiter he was able to receive strong pulses from the planet on 70 cm. Some pulses were up to 30 dB above the 65 K antenna temperature.

No doubt we will be hearing more of these happenings but it is to Doug's credit that his EME station is in such a state of sensitivity that he can make significant observations other than bouncing signals off the moon.

Closure

When you read this we will be in the equinoctial period, so be aware of the

possibility of extended range contacts on six metres. It is also not unknown for the higher bands to indicate enhanced propagation.

Closing with two thoughts for the month:

- 1 A commentary on the times is that the word "honesty" is now preceded by "old-fashioned," and
- 2 Isn't it a shame that future generations can't be here to see all the wonderful things we're doing with their money?

73 from The Voice by the Lake

*PO Box 169 Meningie SA 5264

Fax: 085 751 043 Packet VK5LP@VK5ZK

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What's New

Bob Tart VK3UI*

Second Edition of The World Wide Aeronautical Communications Frequency Directory

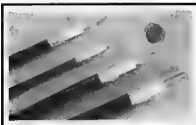
This publication by Robert E Evans is claimed to be the most complete and up-to-date aeronautical frequency listing ever produced, featuring over 2,350 discrete frequencies with full Commercial and Military coverage, encompassing both voice and digital modes in the HF, VHF and UHF bands.

This 260 page book features major, regional and domestic air route information for 137 countries, company operations of 116 airlines, VOLMET broadcasts for 30 world cities and full military coverage of 30 world air forces. Several pages are devoted to informing the reader about message content, code ciphers, digital modes, protocol, etc. There are many pages of photographs along with 12 detailed MWARA sector maps. An extensive glossary, source list and appendices include AFTN, ICAO, IATA, code designators and waypoint data not readily available to the hobbyist or SWL. Order Code BR026. Price \$40.00. Available from Daycom Communications Pty Ltd, 37A Fenton St, Huntingdale VIC 3166. Phone (03) 543 6444, Fax (03) 543 7238.

New Range of Low Loss, Low Cost Foam Double Shielded Coaxial D-FB Cables

The range of D-FB cables is available in 4 types, 5D-FB, 8D-FB, 10D-FB, and 12D-FB, with all cables having a 50 ohm characteristic impedance.

The D-FB series double shielding consists of an aluminium millar foil which encases the dielectric, which is overlaid



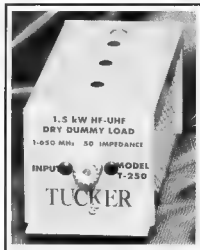
The T-200 is the smallest of the three units. It will handle the requirements of most rigs which have a 100 watt output with ease. It also uses a ceramic load resistor. The ordering number is T-200 and is \$US27.95.

Tucker T-275 2500 Watt Fan Cooled Dry Dummy Load, DC to 150 MHz.



This is the Big Daddy of the Tucker range. It will handle 2500 watts for one minute. The load resistor is wound on a special ceramic former to provide better performance than Carborundum resistors. The SWR is better than 1.3:1 up to 150 MHz. The ordering number is T-275 and is \$US169.00.

Tucker T-250, 1500 Watt Dry Dummy Load, DC to 650 MHz.



The T-250 is similar to the T-275 but does not have a fan for cooling. It is rated at 1500 watts for 10 seconds at a time, is housed in a grey metal housing and has SO239 connectors. The ordering number is T-250 and is \$US54.95.

Tucker Electronics can be contacted at 1717 Reserve St, Garland, TX 75042, USA. Tel 214 348 8800; Fax 214 348 0367.

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ar

by a high density tinned copper braid to give very good EMI/RFI protection. The inner conductor is solid, soft annealed copper to provide great flexibility. A full range of easy to terminate connectors to suit this cable, including BNC and PL259, is available. The 5D-FB is 7.6 mm diam cable with a loss of 3.9 dB/30 metres at 400 MHz; 8D-FB is 11.1 mm diam with a loss of 2.58 dB/30 metres, 10D-FB is 13.1 mm diam cable with a loss of 2.1 dB/30 metres, and 12D-FB is 15.6 mm diam cable with a loss of 1.8 dB/30 metres.

The Australian distributors for these new cables are GFS Electronics, 17 McKeon Rd, Mitcham 3132. Phone (03) 873 3777; Fax (03) 872 4550.

New Tucker Range

T-1000 Antenna Tuner & Dummy Load.



The T-1000 operates on all HF frequencies from 1.8 MHz to 30 MHz with no arc over problems and uses the correct L/C ratios to ensure reliable operation on all bands. It loads up long wires, dipoles, verticals, beams and mobile whips using balanced or unbalanced feed. The unit incorporates a 4:1 balun, 8 outputs selectable from the front panel and a large cross needle meter for easy tune up. An inbuilt dummy load can handle 300 watts.

Tucker T-200, 300 Watt Dry Dummy Load, DC to 150 MHz



Stolen Equipment

The following equipment has been reported stolen. If you have any information that may lead to the recovery of the equipment, please get in touch with the advised contact as soon as practicable.

Make:	Palomar
Model:	Elite TX 5500
Serial Number:	—
Type:	HF linear amplifier
Modifications:	Fuse removed; co-ax "banana plug" socket installed; input SO239 replaced with circular flange type, grey heat sink fins bent at front left; sealing plate of aluminium
Stolen from:	Motor vehicle at Picton
Date:	19 July 1994
Reported to:	Picton police
Owner:	Graham Dalglish
Call sign:	VK2DIG
Contact details:	(046) 772 477 or 018 679 785
Make:	Yaesu
Model:	FT 890
Serial Number:	2K130424
Type:	HF all mode transceiver
Stolen from:	Coburg store of Dick Smith Electronics
Date:	Week beginning 18 July 1994
Owner:	Dick Smith Electronics
Contact details:	George Alexandrakis (03) 428 0933

BT

HF PREDICTIONS

Evan Jarman VK3ANI

The Tables Explained

The tables provide estimates of signal strength for each hour of the UTC day for five of the bands between 7 and 28 MHz. The UTC hour is the first column, the second column lists the predicted MUF (maximum useable frequency); the third column the signal strength in dB relative to 1 μ V (dBu) at the MUF; the fourth column lists the "frequency of optimum travail" (FOT), or the optimum working frequency as it is more generally known.

The signal strengths are all shown in dB relative to a reference of 1 μ V in 50 Ohms at the receiver antenna input. The table below relates these figures to the amateur S-point "standard" where S9 is 50 μ V at the receiver's input and the S-meter scale is 6 dB per S-point.

V in 50 ohms	S-points	dB(μ V)
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10

0.78 S3 2
0.39 S2 -8
0.20 S1 -14

The tables are generated by the GRAPH-DX program from FT Promotions, assuming 100 W transmitter power output, modest beam antennas (eg three element Yagi or cubical quad) and a short-term forecast of the sunspot number. Actual solar and geomagnetic activity will affect results observed.

The three regions cover stations within the following areas:
VK EAST The major part of NSW and Queensland.
VK SOUTH Southern-NSW, VK3, VK5 and VK7.
VK WEST The south-west of Western Australia.

Likewise, the overseas terminals cover substantial regions (eg "Europe" covers most of Western Europe and the UK).

The sunspot number used in these calculations is 21.8. The predicted value for October is 21.2.

VK EAST — SOUTH PACIFIC												
UTC	MUF	dBu	FOT	7.1	14.2	18.1	21.2	24.9				
1	24.2	20.4	8	30	16	14	9	30	23			
2	24.2	20.2	10	30	34	30	30	23				
3	24.1	25.19	13	37	34	30	23					
4	23.8	25.19	19	38	35	30	23					
5	22.4	27.18	27	40	36	30	22					
6	21.2	29.17	42	43	38	29	18					
7	19.2	31.15	50	43	34	25	13					
8	17.4	33.13	53	42	31	20	8					
9	15.5	35.12	54	38	22	13						
10	14.1	37.11	55	36	21	8	12					
11	13.2	38.10	55	34	17	1	-18					
12	12.2	39.9	54	31	12	4	27					
13	11.4	40.13	51	28	7	19	-35					
14	11.1	40.9	53	26	5	13	39					
15	10.8	41.8	53	25	3	-16						
16	9.9	42.7	51	20	4	25						
17	9.3	43.6	49	12	-15	10	34					
18	9.2	43.7	48	10	-15	10	34					
19	12.3	37.93	47	29	11	-26						
20	17.0	30.13	34	36	27	17	3					
21	20.5	27.16	23	37	32	25	15					
22	22.3	26.18	16	36	33	26	19					
23	23.0	25.18	11	38	33	28	21					
24	23.5	25.19	9	35	33	29	22					

VK WEST — SOUTH PACIFIC												
UTC	MUF	dBu	FOT	7.1	14.2	18.1	21.2	24.9				
1	20.1	11.17	4	32	16	14	9	30	23			
2	20.5	11.17	33	16	15	10	1					
3	21.0	11.15	32	16	16	11	2					
4	20.9	12.17	26	18	16	11	2					
5	6.2	13.13	6	17	12	3	12					
6	20.5	15.15	1	29	20	13	3					
7	18.7	18.14	18	28	19	10	3					
8	16.8	21.13	33	28	17	5	-12					
9	14.8	24.17	41	28	17	1	-35					
10	12.9	27.12	43	21	2	16						
11	11.5	29.9	44	18	-28							
12	10.9	30.8	44	13	-11	-35						
13	10.1	31.7	43	10	-17							
14	9.8	32.7	42	7	-22							
15	9.6	32.7	42	5	-24							
16	9.6	32.7	42	6	-23							
17	8.3	34.5	40	-26								
18	6.6	33.6	40	-2	-38							
19	8.5	30.5	34	4	-37							
20	8.1	22.6	22	0	-27							
21	11.2	19.9	11	-8	-4	-27						
22	14.7	15.12	-3	16	6	-5	-23					
23	17.5	13.17	-19	16	11	4	-9					
24	19.2	12.53	-27	18	14	7	-3					

VK EAST — AFRICA												
UTC	MUF	dBu	FOT	7.1	14.2	18.1	21.2	24.9				
1	8.6	7.3	-4	2	-15	-34						
2	8.2	8.3	-3	-21	-33							
3	8.6	9.7	-23	-2	-18	-33						
4	9.1	10.9	-13	-13	-30							
5	18.8	13.0	3	5	-6	-9						
6	18.4	5.13	5	2	-6							
7	18.5	5.13	8	2	-5							
8	17.0	5.13	4	5	-6							
9	15.2	6.10	8	3	-4	-16						
10	13.4	6.10	32	6	0	-10	-26					
11	11.7	7.9	-18	5	-6	-19						
12	10.3	8.1	-6	3	-12	-30						
13	9.6	13.5	8	3	-16	-39						
14	9.1	18.7	16	0	-24							
15	8.9	25.7	20	0	-29							
16	8.9	27.8	32	0	-29							
17	8.8	29.8	35	0	-31							
18	8.3	31.5	38	-4	-38							
19	7.9	31.5	34	-9	-38							
20	8.4	30.7	3	-38								
21	8.3	30.7	35	-38								
22	7.9	24.5	28	-6								
23	7.7	15.5	15	-10								
24	8.3	10.5	6	-5	-29							

VK SOUTH — AFRICA												
UTC	MUF	dBu	FOT	7.1	14.2	18.1	21.2	24.9				
1	8.7	7.3	-8	-1	-39							
2	9.2	8.7	-2	0	-18	-38						
3	12.5	10.9	-15	8	-1	-13	-31					
4	17.4	10.13	-14	12	9	-3	-7					
5	18.0	8.14	1	8	9	-3						
6	19.6	8.14	7	9	6	-2						
7	18.7	8.14	7	9	6	-2						
8	19.0	8.13	7	8	4	-3						
9	17.7	12.5	5	2	-7							
10	16.0	9.11	-31	10	6	-1	-14					
11	14.0	10.9	-18	10	9	-9	-25					
12	12.1	11.8	-7	8	-4	-18						
13	10.8	14.7	5	-13	-32							
14	9.6	18.6	6	2	-31							
15	9.1	24.6	3	0	-28							
16	8.7	27.6	-3	-34								
17	8.8	29.6	-4	-37								
18	8.4	30.5	35	-39								
19	8.2	30.5	35	-7								
20	8.1	30.5	35	-8								
21	8.0	25.7	3	-34								
22	8.4	20.8	35	-38								
23	8.2	24.5	25	-7	-38							
24	8.9	18.6	15	-1	-27							

VK WEST — AFRICA												
UTC	MUF	dBu	FOT	7.1	14.2	18.1	21.2	24.9				
1	8.6	7.3	-4	2	-15	-34						
2	8.7	13.6	7	8	-1	-24						
3	12.2	12.9	-6	10	-2	-18	-37					
4	17.3	11.13	-25	14	0	-2	-6					
5	18.8	9.14	1	10	6	-4						
6	19.6	8.16	1	9	10	5	-3					
7	18.8	8.16	8	9	5	-3						
8	19.3	8.15	8	9	8	-3						
9	18.7	8.15	8	9	8	-3						
10	17.2	8.13	7	9	7	-10						
11	15.3	10.13	-25	11	5	-4	-19					
12	13.4	12.16	-8	11	0	-12	-31					
13	11.7	15.9	9	7	-7	-24						
14	10.3	20.8	6	1	-16	38						
15	9.6	25.7	31	3	-23							
16	9.1	28.7	34	0	-30							
17	8.7	29.7	37	0	-37							
18	9.0	31.7	38	-1	-33							
19	8.9	31.6	38	1	-33							
20	8.4	31.5	37	-10								
21	8.3	31.5	37	-10								
22	8.6	31.5	37	-4	38							
23	8.8	31.6	38	-1	-33							
24	8.2	27.6	30	-7								

VK EAST — ASIA												
JTC	MUF	dBu	FOT	7.1	14.2	18.1	21.2	24.9				
1	23.7	13	16	17	19	17	10					
2	24.3	12	18.7		16	19	17	11				
3	24.5	12	19.5		16	19	17	12				
4	23.7	13	20.4		16	19	17	12				
5	24.5	13	20.1		18	21	18	12				
6	23.6	14	19.2	30	20	21	18	11				
7	22.2	15	17	-15	23	21	17	8				
8	20.8	17	17.4									
9	19.1	19	20	15.3	34	33	23	13	-1			
10	17.4	21	13.9	40	31	18	6	-10				
11	15.2	22	11.1	40	24	14	4	-18				
12	15.2	23	12.1	47	27	10	5	-27				
13	14.1	24	11.2	48	24	4	-14	-38				
14	12.9	25	10.3	47	18	4	-25					
15	12.1	25	9.1	45	11	-15						
16	11.6	26	9.1	45	11	-15						
17	10.4	27	8.1	42	2	-29						
18	9.8	28	7.6	39	-15							
19	9.2	28	7.1	39	-10							
20	9.6	28	7.4	40	-4							
21	14.7	21	11.3	35	23	8	-7	-29				
22	16	22	11.2	37	27	7	-7	-27				
23	20.3	14	18.4	21	22	22	18	10				
24	23.3	13	19.0	-34	19	20	17	10				

VK EAST — EUROPE				VK SOUTH — EUROPE				VK WEST — EUROPE			
UTC	MUF	dBu	FOT	UTC	MUF	dBu	FOT	UTC	MUF	dBu	FOT
1 8.9	7	6.4	26	1 14.2	18.1	21.2	24.9	1 10.2	7	7.2	5
2 9.5	13	3	32	2 9.2	7	6.6	-29	2 9.5	5	8.9	-13
3 9.5	-12	7	1	3 10.2	8	7.4	—	3 10.6	1	7.7	32
4 11.7	7	8.2	—	4 12.7	4	8.7	—	4 13.4	1	9.0	2
5 14.4	4	7.1	—	5 15.7	4	8.7	—	5 16.7	3	12.3	—
6 16.4	4	12.3	—	6 17.0	2	13.2	—	6 19.0	3	14.0	—
7 17.5	3	13.2	3	7 18.9	4	14.0	—	7 20.1	5	14.8	—
8 18.3	6	13.9	—	8 19.4	5	14.6	—	8 20.9	6	15.4	—
9 19.7	7	14.6	—	9 19.7	6	14.8	—	9 21.3	6	15.9	—
10 19.7	10	13.6	—	10 15.9	5	12.6	—	10 19.8	6	15.9	—
11 15.3	12	12.2	24	11 13.9	6	11.0	—	11 18.0	7	15.2	—
12 14.1	15	11.2	—	12 12.1	8	9.6	-20	12 16.3	10	12.9	35
13 12.9	18	10.2	—	13 12.9	8	9.6	-20	13 14.5	8	9.9	13
14 12.3	2	9.7	20	14 10.1	17	8.0	13	14 13.2	17	10.4	9
15 11.4	25	8.0	32	15 9.6	24	7.6	28	15 12.4	21	9.8	24
16 11.0	27	8.6	36	16 9.9	27	7.4	33	16 11.6	24	9.2	32
17 10.6	28	7.3	39	17 9.5	28	7.3	35	17 11.0	28	8.6	36
18 9.8	29	7.5	38	18 9.5	29	7.4	37	18 10.8	27	8.5	39
19 8.3	30	6.4	35	19 8.9	29	6.9	36	19 10.5	27	8.2	37
20 8.0	30	6.7	36	20 8.3	30	6.4	34	20 9.3	28	7.5	37
21 9.4	31	7.2	38	21 8.9	29	6.8	36	21 8.6	29	6.8	35
22 9.7	21	7.3	20	22 11.0	27	7.7	37	22 9.0	28	6.9	36
23 9.7	10	6.9	0	23 9.5	21	7.3	29	23 9.6	29	7.5	38
24 9.2	0	6.6	16	24 10.0	12	7.6	8	24 9.7	22	7.4	25

VK EAST — EUROPE (Long Path)				VK SOUTH — EUROPE (Long Path)				VK WEST — EUROPE (Long Path)			
UTC	MUF	dBu	FOT	UTC	MUF	dBu	FOT	UTC	MUF	dBu	FOT
1 10.5	4	7.0	19	1 9.6	1	6.6	-21	1 9.2	11	6.4	35
2 10.1	8	6.8	10	2 9.1	3	6.3	10	2 8.7	-9	6.1	-25
3 9.5	8	6.5	1	3 8.6	7	6.0	0	3 8.2	-6	5.8	-16
4 9.2	14	6.4	8	4 8.2	12	6.0	-4	4 7.9	-5	5.6	-21
5 8.8	17	6.2	15	5 8.2	22	5.9	-23	5 7.9	-7	5.7	-2
6 8.8	23	7.0	24	6 8.1	21	6.7	22	6 8.8	7	6.5	1
7 10.1	24	8.1	30	7 7.7	28	7.2	-27	7 11.0	13	7.0	-12
8 12.7	23	9.8	22	8 13.5	22	9.5	28	8 12.9	14	9.7	8
9 8.8	14	7.5	5	9 11.9	18	8.2	14	9 14.7	14	11.0	8
10 9.5	5	7.4	-12	10 9.4	11	7.2	-1	10 13.6	13	9.1	0
11 10.1	2	7.2	2	11 9.5	6	6.6	12	11 19.2	22	8.8	-12
12 9.8	9	7.5	-37	12 9.1	-4	6.2	22	12 9.8	-3	6.9	-25
13 9.3	15	7.3	0	13 8.7	11	6.1	-31	13 9.4	-8	6.4	-33
14 9.3	18	7.3	0	14 8.7	19	6.0	-3	14 8.9	16	6.0	-2
15 9.2	27	7.3	0	15 8.6	37	6.0	-11	15 9.2	33	6.9	-10
16 8.7	6	5.7	14	16 8.2	5	5.8	-22	16 8.8	5	5.8	-17
17 8.2	6	5.2	-21	17 8.0	5.7	5.3	-29	17 8.5	5.8	5.8	-23
18 8.0	18	6.3	17	18 7.7	5.7	5.3	-27	18 8.1	5.7	5.7	-36
19 10.8	-14	6.5	2	19 10.3	21	7.1	-7	19 10.7	3.6	3.6	—
20 14.1	3	10.7	3	20 13.1	-7	9.7	-4	20 8.5	6.1	6.1	-23
21 14.9	0	10.1	1	21 13.8	-5	9.6	-3	21 10.2	-21	8.8	-6
22 13.2	0	10.1	1	22 13.2	-2	8.2	-1	22 11.1	-10	7.5	-2
23 10.2	1	8.1	3	23 11.1	-5	7.7	0	23 10.7	14	7.5	-3
24 11.2	2	7.5	29	24 10.2	-4	7.0	-34	24 9.1	13	6.8	-2

VK EAST — MEDITERRANEAN				VK SOUTH — MEDITERRANEAN				VK WEST — MEDITERRANEAN			
UTC	MUF	dBu	FOT	UTC	MUF	dBu	FOT	UTC	MUF	dBu	FOT
1 10.4	1	7.9	26	1 10.1	4	7.4	-12	1 8.9	13	6.9	8
2 10.5	1	7.9	26	2 10.3	1	7.4	-12	2 8.9	13	6.9	8
3 14.5	1	10.9	1	3 14.6	1	11.5	-3	3 13.3	6	10.5	-36
4 15.8	8	15.0	—	4 20.0	7	15.4	0	4 18.2	7	14.0	—
5 16.8	8	15.0	—	5 21.1	5	17.7	7	5 20.8	7	15.4	—
6 22.8	6	18.7	—	6 21.1	5	17.5	-4	6 20.3	6	16.9	—
7 22.0	6	17.9	4	7 20.8	5	17.0	-4	7 20.3	5	16.8	—
8 22.4	6	18.4	—	8 20.1	5	16.3	-2	8 20.1	5	16.8	—
9 18.6	6	18.6	—	9 18.5	5	16.8	-3	9 19.3	5	17.7	—
10 16.9	9	13.4	8	10 18.4	6	13.0	5	10 17.9	6	14.4	—
11 15.0	11	11.9	29	11 14.4	7	11.4	-39	11 16.2	7	13.8	—
12 13.7	14	10.9	-9	12 12.5	10	9.9	-16	12 14.5	10	11.5	-20
13 12.9	19	10.2	12	13 11.1	14	9.8	-4	13 12.8	14	10.2	11
14 12.1	24	9.5	31	14 10.4	20	8.2	20	14 11.8	19	9.2	20
15 11.4	25	8.0	36	15 9.8	24	7.8	29	15 10.9	23	8.7	30
16 11.0	26	7.3	37	16 9.6	26	7.6	32	16 10.3	22	8.1	31
17 10.8	29	6.4	40	17 9.7	28	7.6	37	17 9.9	27	7.9	37
18 9.9	29	7.6	39	18 9.7	28	7.5	38	18 9.8	28	7.7	38
19 8.7	30	6.7	36	19 9.1	29	7.0	36	19 8.6	28	7.5	38
20 7.7	30	6.7	36	20 8.5	28	6.8	36	20 8.5	28	6.8	36
21 12.2	27	9.6	42	21 9.2	29	7.0	37	21 8.9	29	6.2	33
22 11.5	25	8.9	19	22 10.4	29	8.1	39	22 8.5	29	6.5	35
23 10.3	18	7.9	8	23 10.1	22	7.8	22	23 10.4	28	8.1	-9
24 11.4	10	6.6	11	24 11.6	16	6.9	6	24 9.5	23	7.3	27

VK EAST — USA/CARIBBEAN				VK SOUTH — USA/CARIBBEAN				VK WEST — USA/CARIBBEAN			
UTC	MUF	dBu	FOT	UTC	MUF	dBu	FOT	UTC	MUF	dBu	FOT
1 23.5	8	19.8	8	1 21.6	8	16.1	3	1 20.5	7	16.7	-2
2 21.1	10	18.8	8	2 21.5	11	16.0	-25	2 20.7	8	16.7	-2
3 12.7	19	17.2	-38	3 18.2	13	16.2	-5	3 17.7	9	16.1	9
4 15.5	15	12.3	11	4 16.4	16	13.0	-10	4 15.4	10	12.2	10
5 14.2	19	11.3	10	5 15.0	19	11.9	12	5 14.1	11	11.1	23
6 13.4	24	10.6	31	6 14.1	24	11.2	32	6 13.2	17	10.4	-4
7 12.7	26	10.1	36	7 13.3	26	10.7	38	7 12.1	18	9.9	-15
8 12.3	27	9.6	40	8 13.0	27	10.2	41	8 12.1	27	9.5	32
9 11.7	29	9.1	42	9 12.4	28	9.7	42	9 11.5	29	9.0	39
10 10.6	29	8.4	41	10 11.3	28	8.8	41	10 10.8	31	8.3	41
11 10.6	30	7.5	39	11 10.0	30	7.7	39	11 9.6	32	7.1	40
12 10.6	30	8.1	41	12 10.1	29	7.9	39	12 10.7	32	8.2	42
13 11.6	28	9.1	41	13 9.9	29	7.8	38	13 10.5	31	8.3	41
14 9.6	25	7.6	35	14 9.6	28	7.6	38	14 10.0	32	7.9	41
15 9.8	18	7.6	14	15 9.8	17	7.7	12	15 9.8	20	7.8	17
16 9.8	9	7.6	-4	16 9.3	6	7.1	5	16 9.9	13	7.7	2
17 8.5	3	6.5	15	17 8.6	3	6.6	17	17 9.9	9	6.7	-14
18 8.9	-6	28	2	18 8.2	2	7.0	30	18 9.2	10	6.8	-25
19 12.1	-3	9.2	0	19 11.5	-4	9.0	0	19 8.6	12	6.6	-31
20 16.8	3	13.0	0	20 15.1	1	11.5	0	20 9.2	-13	7.0	1
21 20.2	5	15.9	3	21 18.1	3	14.1	-3	21 11.4	-8	9.0	0
22 21.8	5	17.2	4	22 19.9	5	16.8	-4	22 11.4	-8	9.0	0
23 22.5	6	18.3	-4	23 20.9	5	16.9	-4	23 10.0	3	14.1	5
24 22.9	7	16.0	2	24 21.1	6	17.5	1	24 19.6	5	15.6	-5

HAMADS

TRADE ADS

● **AMIDON FERROMAGNETIC CORES:** For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please)

14 Boonyo Ave Kiama) Agencies at Geoff Wood Electronics, Sydney Webb Electronics, Albany Assoc TV Service, Hobart Truscott's Electronic World Melbourne Aplha Tango Products, Perth

● **WEATHER FAX programs for IBM XT/ATs *** "RADFAX2" \$35-00,** is a high resolution shortwave weatherfax, Morse and RTTY receiving program Suitable for CGA, EGA, VGA and Hercules cards (state which) Needs SSB HF radio and RADFAX decoder *** "SATFAX" \$45-00, is a NOAA, Meteor and GMS weather satellite picture receiving program Needs EGA or VGA & **WEATHER FAX PC card, + 137 MHz Receiver *** "MAXISAT" \$75-00** is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.8 or 4.0) and 1024 x 768 SVGA card All programs are on 5.25" or 3.5" disks (state which) plus documentation, add \$3-00 postage. **ONLY** from M Delahunty, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

FOR SALE ACT

● **YAESU FT-207R handheld, PA2 power adapter, YM24A speaker microphone \$150, FT-207R, YH-1 headset, box, manual, charger, \$150.** Andrew VK1AS (062) 86 2793 AH (062) 39 0774 BH

FOR SALE NSW

● **SATELLITE Dish 1.2 metres diameter, white in colour, good condition, spun aluminium, commercially built. Why pay a brand new price of \$300? Just the thing to get started into satellite viewing, skychannel, pay TV. Sell, \$150 ono. Coin VJ2JCQ (02) 476 2651 after 6pm**
● **COMPUTER, old, CP/M, 280, plus software, serial terminal, printer, all working. TV camera, B&W, Ikegami 6000, viewfinder, working. Offers. Ray VK2ZON (02) 489 8561**
● **CUSHCRAFT 11 element Yagi; 70, BRUEL & KJAER and a spectrometer type 2212 \$300. A Brooks VK2BKS QTHR (063) 82 3069.**

● **BEAM ANTENNA Chirnside 10/15 m 4 element c/w balun, vg condition, \$100 Ted VK2BTB (02) 644 4071**
● **KENWOOD TS430S s/n 3052227 A1 condition, handbook and money back guarantee letter \$950, TET EMTRON TE23M twin element 10/15/20 m boom 2 m element 5 m ideal for small area, near new, \$200. Peter VK2FFA (043) 24 4160.**

● **ICOM STATION** consisting of top of range IC781 transceiver, IC2KL solid state linear plus IC-AT500 automatic antenna tuner all in top condition, \$7000. Eric VK2JN (02) 449 4324

● **4CX250 with socket chimney, power supply, blower. What offers? David VK2BDT (048) 21 5036.**

● **ICOM P2CT 2 m handhelds (2) including BP114 (12v 400 mA) battery packs and charging leads and carry cases. Horst VK2HL (02) 982 7685 AH or (02) 971 9795 BH**

FOR SALE VIC

● **YAESU FT690R Mark 2, 6 m all mode Tx Rx with integral 10 W amp and mobile cradle, \$650. Damien VK3CDI (054) 27 3121**

● **ICOM IC-02A 2 metre handheld xcvr with accessories, \$350. Lindsay VK3ANJ QTHR (051) 55 1380.**

● **YAESU FL200B SSB/CW transmitter and matching Yaesu FR100B/CW transceiver for HF amateur bands, including manuals, \$350; YAESU FLDX2000 HF linear amplifier, \$350. All equipment in excellent working condition. Peter VK3FDX (059) 62 2563 AH**

● **COLLINS KWM2 xcvr, ex cond, with PM2 p/s, instr book, and Collins CC2 carry case. Working but has relay problem, \$450 ono. KENWOOD TS-120S, vgc, \$500; YAESU FT-747GX, ex, \$850. Ron VK3OM QTHR (059) 44 3019**

● **ESTATE OF VK3TV GEMTRONICS GTX2325 23 ch AM/SSB CB, \$20, REALISTIC AX190 amateur band HF Rx with speaker and 100, \$150; COLLINS 51J3 30 band M/HF/Rx, \$300, HP 211A square wave generator 10 MHz to 420 MHz, \$200; HP 608D AM spg generator 10 MHz to 420 MHz, \$200; HP 430C Bolometer (trying to find all parts and h/books), offer; PRINTED circuit board holder, \$30; AVO MKII valve tester, with operational h/book but still to find valve data book, \$200; BOOKS — Hawkins Electrical guides 5, 7, 8, 9 of 1917, 202 ea, GRUNDIG GDO 240 volt, 1.7 to 250 MHz, \$40, MICRONTA AC clamp amp meter (new), \$50, WHITES coinmaster 6000/D metal detector, \$300, REALISTIC PRO 2023 16 ch VHF/UHF scanner with warranty, \$150; BWD 821A 50 MHz dual beam CRO, \$700; HEATHKIT GDO 500 kHz to 250 MHz, \$30; PHILIPS GM6014 AF/RF millivolt meter, \$50, PHILIPS GM6001 electronic voltmeter, \$40; PHILIPS PM2440 millivolt meter, 1 mV to 1000 V, \$30, HP 9704 probe multimeter, \$30. Many bits and pieces too numerous to list. Alan was a keen experimenter and had a lot of equipment and components, and it was of high quality — many items complete with handbooks, and most will be in good working order. As things are sorted lists will be made of what is available. Rodney VK3UG QTHR (057) 62 1454**

● **ANTENNA 5 ELEMENT in-bander 14/21/28 MHz. Original Werner Wulf item, \$550 VK3NF (03) 529 3265.**

● **PHILIPS 2 m amateur radio, repeaters, packet and simplex frequencies, 2 scanners, remote control, 25 W transmitter, facility sockets, mounting kit, \$275. Don VK3GMK 015 529 475**

FOR SALE QLD

● **HEATHKIT SB-201 HF linear amplifier 1200 w 80-10 m mint condition, never used, complete with manual, \$800. LAO David Wescombe-Down VK4CMY (076) 85 2167 AH**

● **YAESU FRG8800 general coverage receiver, vgc, \$800 ono; KENWOOD R820 receiver (matches TS820) vgc, \$500 ono, STANDARD C150 2 m handheld, receives 130-170 MHz, \$400 ono, SONY ICF2001 Rx vgc, \$250 ono. Steve VK4KHQ (018) 74 3231**

● **SHACK Clearance sales Fell, 97 Jubilee Terrace, Bardon, Sundays, September 11 and 25. Queries Peter VK4APD QTHR (07) 397 3751 AH**

● **AMATEURS Paradise** four bedroom brick home 2000 ft as: Goldcoast and mountain views, master bedroom ensuite fourth bedroom shack. Large lounge and sitting room open fireplace, Nally tower rotator beams Mrs Clarke, PO Box 67, Nerang Qld 4211

● **AMATEURS Delight!** 10.3 Ha, 3 Br brick 18 mths old, good fencing, 6x6 m garage, 4 dams, 915 m altitude, great take-off and views, 1/4 wavelength 80/40 m GPs, 4.5 km radial system, 2.5 hrs Goldcoast, 15 mins Stanthorpe, 25 mins Warwick, \$136,000 negotiable. "Doc" VK4CMY (076) 85 2167

● **VINTAGE RECEIVER & HORN SPEAKER, ERLA Monodine S-50** made by "Electrical Research Laboratories" Chicago, Illinois, circa 1920s. Complete with all original knobs, dials, components, 5 "XIA" valves and wooden case. Original instruction sheet still intact inside lid. Requires restoration & polishing. Also Philips bakelite horn speaker. Best offer considered. Gary VK4AR QTHR (07) 353 1695.

● **DIPLEXERS for 70 CM repeaters, isolation better than 60 dB, insertion loss better than 1 dB, N-type connectors, small rack chassis type, \$250. Another unit, same as above except isolation is about 90 dB, insertion loss better than 2 dB, \$300. Gary VK4AR QTHR (07) 353 1695**

FOR SALE SA

● **EDDYSTONE communications receiver model S640, serial LA2078, with emphasis on amateur bands from 1.7 MHz to 32 MHz, collectors item, mint condition with book, \$220. Bob VK5QJ, 7 Hewitt Ave, St Georges SA 5064, (08) 379 1845.**

● **YAESU FT200 good condition with power supply, \$320 ono. Nail VK5ANF (085) 821 270.**

FOR SALE WA

● **KENWOOD TS940S HF xcvr as new cond, orig carton, complete with manual and mike, \$2600. John VK6AJW (09) 397 6944.**

WANTED NSW

● **WANTED for Kenwood T/R TS25DS, digital display DG-5, aerial tuner AT200. Bill VK2SUB (065) 54 7404**

- KENWOOD TR-851A 70 cm all-mode transceiver. John VK2ATU (02) 792 2275.
- VIDEO Camera national WV-2600E/WV300E WV3200E or similar. Also wanted for parts VCRs Toshiba V-33A and Sony SLC6AS. Neville VK2QF QTHR (063) 73 8624.
- GUY rope, heavy duty, approx 125 metres, suitable for holding 14 metre tower. Malcolm VK2BMS QTHR (02) 257 4583 BH or (02) 958 1114 AH.
- MANUAL or circuits for wireless set C42 and supply unit vibratory No 12 MK2. Peter VK2CPK QTHR (02) 605 4790.
- WANTED for restoration project, AR7 coil boxes, any condition. Would consider complete receiver. Also wanted National HRO, any condition. Stan VK2EL QTHR (044) 55 5825.

WANTED QLD

- MOTOROLA "Pulsar" manual model T1777ASP2 or good photocopy of circuit or circuits. Will pay costs. Cliff VK4QJ QTHR (076) 98 1223.
- TYPE SN76S14 mixer ICs. Len VK4JZ QTHR (076) 966 455.

WANTED WA

- WANTED Ten Tec Argonaut 509 or similar. Allan VK6LL, QTHR. Please write or phone (09) 446 1568.

MISCELLANEOUS

- THE WIA QSL Collection (now Federal) requires QSLs. All types welcome especially rare DX pictorial cards special issue. Please contact Hon Curator Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, Tel (03) 728 5350.

BT

**This space
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money!**

**Advertising
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PO Box 2175
Caulfield
Junction Vic,
3161**

Editor's Comment

Continued from page 3

less than 200,000 and 100,000 respectively. And Canberra is a very special case, where the Canberra Radio Society became the ACT Division of the WIA.

In every case, the lack of central city meetings has been compensated by the rise of radio clubs, some now larger than the WIA was 40 years ago! No club member need travel more than a few kilometres to his local meeting place. But, although mostly affiliated with it, the clubs are not the WIA.

I could go on further! I could talk about larrikins on FM repeaters (seldom a problem in cities of under a million). But space does not permit. Maybe next month?

**Bill Rice VK3ABP
Editor
BR**

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.

*Eight lines per issue free to all WIA members, ninth line for name and address

Commercial rates apply for non-members. Please enclose a mailing label from this magazine with your Hamad.

*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.

*Copy typed or in block letters to PO Box 2175,

Caulfield Junction, Vic 3161, by the deadline as indicated on page 1 of each issue.

*QTHR means address is correct as set out in the WIA current Call Book.

*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.

*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.

Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows: \$25.00 for four lines, plus \$2.25 per line (or part thereof) Minimum charge — \$25.00 pre-payable.

State:

Not for publication:

☐ Miscellaneous

☐ For Sale

☐ Wanted

Name: Call Sign: Address:

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with **strictly**.

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

TYPESETTING AND PRINTING:

Industrial Printing and Publicity Co Ltd, 122 Dover Street, Richmond, 3121.

Telephone: 428 2958

MAIL DISTRIBUTION:

R L Polk & Co Pty Ltd, 96 Herbert St, Northcote, Vic. 3070. Tel: (03) 482 2255

CONTRIBUTIONS TO AMATEUR RADIO

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. "How to Write for Amateur Radio" was published in the August 1992 issue of AR. A photocopy is available on receipt of a stamped, self addressed envelope.

BACK ISSUES

Available only until stocks are exhausted. \$4.00 to members, which includes postage within Australia.

PHOTOSTAT COPIES

When back issues are no longer available, photocopies of articles are available to members at \$2.50 each (plus \$2.00 for each additional issue in which the article appears).

The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

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HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 2175
Caulfield Junction, Vic 3161

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms:.....

Call Sign (if applicable):.....

Address:.....

State and Postcode:.....

VK QSL Bureaux

The official list of VK QSL Bureaux. All are Inwards and Outwards unless otherwise stated.

VK1	GPO Box 600 Canberra ACT 2601
VK2	PO Box 73 Teralba NSW 2284
VK3	40G Victory Boulevard, Ashburton VIC 3147
VK4	GPO Box 638 Brisbane Qld 4001
VK5	PO Box 10092 Gouger Street Adelaide SA 5000
VK6	GPO Box F319 Perth WA 6001
VK7	GPO Box 371D Hobart Tas 7001
VK8	C/o H.G Andersson VK8HA Box 619 Humpty Doo NT 0836
VK9/VK0	C/o Neil Penfold VK6NE 2 Moss Court Kingsley WA 6026

WIA Divisional Bookshops

The following items are available from your Division's Bookshop
(see the WIA Division Directory on page 3 for the address of your Division)

Ref	List Price	Ref	List Price
ANTENNAS			
Ant. Compendium Vol 2 Software 5.25" IBM Disk	BF293 \$22.00	Antenna Radio Awards Book - RSGB	BR297 \$30.00
Ant. Compendium Vol 3 1st Ed. 1992	BR455 \$37.00	Antennae Techniques - G3VJA - RSGB	BR393 \$30.00
Antenna Compendium Vol 2 - APRL	BF292 \$32.00	DXCC Companion - How to Work Your First 100	BR345 \$16.00
Antenna Impedance Matchbox - APRL	BF297 \$52.00	DXCC Country Listing - APRL	BR385 \$5.00
Antenna Note Book W1FD - APRL	BF179 \$26.00	FOC Rule Book - A Guide to the FOC Regulations	BR378 \$24.00
Antenna Pattern Worksheets Pkt of 10	BF102 \$3.00	Log Book of Europe - RSGB	BR205 \$8.00
Circuit Card Antennas - Newell - 1993	BR041 \$27.50	Log Book - APRL - 2" x 11" Wound Bound	BR202 \$9.00
Easy Log Antennas	BF-09 \$39.25	Low Band Dosing - John Devillers	BR105 \$20.00
G-CPH Antenna Handbook - RSGB - 1992 1st Edition	HA452 \$22.50	Operating Manual - APRL - 4th Edition	BR102 \$48.00
HF Antenna Collection - RSGB	BF031 \$44.00	Operating Manual - RSGB	BR381 \$31.00
HF Antennas for all Locations - Moxon - 2nd Edition	BF188 \$45.00	Passport to World Band Radio	BR346 \$45.00
HF Antennas for all Locations - RSGB - 1993	BF008 \$45.00	Profile Map of the World - RSGB (unprinted)	BF387 \$25.00
Antenna Compendium Vol 1 - APRL	BF183 \$26.00	RTTY/VAMTOR Companion APRL 1st Ed 1993	BR345 \$51.00
Noise Antenna Notebook - DeLuxe W1FB - APRL	BF102 \$20.00	The Complete DXer - W9WNI	BR194 \$32.00
Physical Design of Yagi - 2.5" IBM Disk	BF080 \$20.00	Transmitter Tuning	BR222 \$43.00
Physical Design of Yagi - 3.5" Map Disk Excel Format	BF183 \$26.00	World Grid Location Atlas - (Maderhead Location) - APRL	BR187 \$10.00
Physical Design of Yagi 5.25" IBM Disk	BF080 \$20.00		
Practical Wire Antennas - RSGB	BF026 \$22.00		
Reflections Transmission Lines and Antennas - 5.25" IBM	BF348A \$22.00		
Reflections Transmission Lines and Antennas - APRL	BF348 \$22.00		
The Antenna Handbook - APRL 1991 edition	BF026 \$22.00		
Transmission Line Transformers - APRL	BF329 \$32.00		
Vertical Antenna Handbooks - Lee - 1990	BF294 \$22.00		
Yagi Antenna Design - APRL	BR184 \$40.00		
CALL BOOKS			
Radio Call Book International 1994	BF039 \$55.55		
Radio Call Book North America 1994	BF039 \$55.55		
RSGB Call Book 1993/4	BA485 \$38.00		
FICTION			
Q Ghost Ship - APRL	BF204 \$13.00		
Death Valley QTH - APRL	BF205 \$13.00		
DI Bianga Canger - RSGB	BF207 \$13.00		
Grand Canyon QSO - APRL	BF207 \$13.00		
Murder by QRM - APRL	BF208 \$13.00		
QCS At Midnight - APRL	BF209 \$13.00		
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RFPA Handbook for Amateur Operators - Beaman - 2nd Ed	BF205 \$47.50		
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on the Air Car Bumper Sticker - RSGB	BF187 \$2.75		
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Antennae Techniques - G3VJA - RSGB	BR393 \$30.00		
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If the items are carried by your Divisional Bookshop, but are not in stock, your order will be taken and filled as soon as possible.

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All orders must be accompanied by a remittance.

The prices are correct as at the date of publication but, due to circumstances beyond the control of the WIA, may change without notice.

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IC-R7100



IC-R100



IC-R72



IC-R1